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GEOGRAPHICAL THOUGHT
A Contextual History of Ideas

by

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PHI Learning Private Limited
New Delhi-110001
2011

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₹ 225.00

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ISBN-978-81-203-1182-4

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Tenth Printing ... ... April, 2011

Published by Asoke K. Ghosh, PHI Learning Private Limited, M-97, Connaught Circus, New Delhi-110001 and Printed by Rajkamal Electric Press, Plot No. 2, Phase IV, HSIDC, Kundli-131028, Sonepat, Haryana.

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Preface

This book is the outgrowth of over twentyfive years of teaching and interaction with the graduate students at various universities. It represents the fruits of my concerted effort to develop a course 'structure' on geographical thought with a view to enable the student to visualize the history of geography as a professional field and to stimulate interest in the conceptual evolution of the subject as a discipline focussed on understanding man's relation with his environment.

The main focus of the book is on modern geography since the end of the eighteenth century—the Age of Humboldt—the period to which the birth of modern geography is generally traced. But the earlier periods have not been neglected. As such, the book includes discussions on the development of the content and methodology of geography beginning with the ancient Greeks (to whom the European tradition of geographical learning is traced), the Arab ascendancy in geographical learning during the middle ages (when geographical learning in Europe had suffered complete eclipse owing to the stranglehold of theocracy), followed by a comprehensive statement on the age of exploration in the sixteenth and seventeenth centuries (when the greatly expanded horizon of geographical knowledge about lands and peoples across the globe stimulated a renewed spirit of inquiry about man's relationship with nature). The rising importance of geographical knowledge, during this period when the earth surface had become a closed system of interacting parts through the transformation of the previously intractable oceans into high seas, had greatly added to the prestige of geography as a branch of learning. Such a perspective on past development provides the necessary background for a wholesome understanding of the later developments in concept and methodology.

The approach is all through contextual, so that each phase of development, and each major thinker and innovator, is placed in the context of his time, and is viewed against the backdrop of the contemporary intellectual, socio-economic, and cultural cross-currents. Such an approach helps us appreciate each conceptual-theoretical advance in its correct perspective, and thereby highlights the status of geography as a science actively participating in the resolution of societal problems of the day. The contextual approach to the study of the history of ideas in geography makes the study of the subject an attractive and stimulating engagement.

The purpose of this volume is to provide a handy but comprehensive textbook for students preparing for Honours and postgraduate degrees in geography in Indian universities. It should be equally useful to students at this level elsewhere in the Third World. The book is written in an easy and straightforward style in order that the subject matter becomes easy to

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grasp. Every aspect of the development of geographical thought has been covered so that this book should stand out as a handy and self-sufficient text, meeting the course requirements in the different Indian universities. The wide coverage of the text should also make it a useful guide for the aspirants for higher competitive examinations. The latest trends in the discipline up to the 1990s have been discussed in order to make this volume an up-to-date and comprehensive statement on the subject.

This book has been in the making for a long time. I have enjoyed writing and discussing it with students and colleagues. I hope it will succeed in imparting some of this joy to the young geographers in the making, for whom it is designed. Suggestions for improvement would be gratefully acknowledged and incorporated in future editions wherever necessary.

R.D. Dikshit

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Introduction

Geography, as a branch of learning, is focused on understanding the relationship between man and nature. The edifice of geography as a discipline is thus built on the experiences of successive generations of mankind (since the dawn of history) in trying to comprehend the world of which their own homeland forms but a small part. Viewed thus, history of geography is fundamentally concerned with the development of human consciousness about the possibilities and limitations that the external world of nature presents for man's growth and progress. The thirst for geographical knowledge is as old as human curiosity, since some of the earliest questions agitating the mind of primitive man must have related to the character of his natural surroundings. There is a natural urge in man to gain knowledge about the lands and peoples living beyond his own territory. Such a curiosity is at least partly utilitarian since the world beyond the familiar may contain greener pastures and present greater possibilities for adventure.

The word *geography* was first used by the Greek scholar Erastosthenes in the third century B.C. It is derived from the Greek *ge* (the earth) and *graphe* (description), so that geography as a discipline is focused on the description of the earth surface as the world of man. Thus, according to Hartshorne (1959), as a discipline, "geography is concerned to provide accurate, orderly, and rational description and interpretation of the variable character of the Earth surface". By the phrase "Earth surface", geographers imply the thin zone extending as far down below the surface as man has been able to penetrate and as far high above the surface as man normally goes. Since man's reach above as well as below the earth surface is relative to the level of technological progress, the thickness of this zone of study has been progressively increasing. This zone has been the universe of all human endeavour—all art and science—except for space explorations since 1969.

ANOMALOUS STATUS OF GEOGRAPHY AS A DISCIPLINE

The focus of geography on "the earth surface as the world of man" as its special field of inquiry had put it in a somewhat anomalous position within the traditional organization of knowledge into distinct disciplines, since one of the basic premises of the principle of this organization was the fundamental separation between man and nature. Study of man was the realm of humanities and the social sciences whereas the sciences focused on the study of aspects of nature. Geography's difficulty arose from the

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fact that focus on the study of the surface of the earth simultaneously required focus on man as well as nature since the earth surface comprises both man-made phenomena, as well as those of natural origin produced by physical, chemical, and biotic processes. As such, geography could neither claim status as a pure science nor as a pure human or social science subject. This was the source of much confusion in the formative phase of geography as a modern discipline in the nineteenth century when division of knowledge into distinct disciplines was being concretized.

The intensity of the problem was all the more grave because, although one of the oldest subjects of scholarly speculation, geography was a late starter as a university level discipline. The first university departments of geography headed by professors began to be established only in the 1870s by which time the other disciplines studying man and nature had already carved out their own specific areas of inquiry. Humboldt and Ritter had demonstrated the usefulness of geography as an integrated study of the earth surface as the world of man in the first half of the nineteenth century. Humboldt claimed for it the status of a universal science. His status as the greatest living scholar of his time had not posed much difficulty in the location of geography in the academia in his lifetime. The confusion, however, greatly intensified by the mid-century after his death which coincided with the period of maximum concretization of disciplinary division. The result was that the status of geography vis-a-vis the social sciences on the one hand and the natural/physical sciences on the other, could be resolved only in the 1880s through the exertions of many scholars, most prominent among them being Ratzel and Richthofen in Germany, and Vidal de la Blache in France, who variously projected it as an integrated study of the great man-environment system representing the universe of human action—as against the other systematic sciences each of which focused on particular aspects of the man-environment reality in isolation. The intellectual origins of geography as a distinct field of study focused on the great man-environment system go back to the ancient Greeks who viewed man as an integral part of nature, so that geographical description of places in Greek literature included the treatment of all organic as well as inorganic phenomena (including man).

Glacken (1967) has identified three different views of the man-environment relationship in the history of Western thought before the nineteenth century. The earliest was the view of mankind in harmony with nature; next came the view that man's life upon earth is dominated by nature, to be followed by the view that man dominates nature through technological intervention. The view of geography as an integrated science of man-environment relationships is a legacy of the classical Greek period. However, the changing mood of society on the issue of man-environment relationships was inevitably reflected in later debates regarding determinism and possibilism in geographical literature. The former approach held that nature determines the course of human development and progress whereas the latter approach held that in the last analysis it is human will and

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ingenuity that decide in what direction progress shall take place. The protagonists of this approach believed that nature offers many possibilities, many possible directions of progress. The direction actually chosen depends on human choice. In the current phase of environmental protectionism and advocacy for the maintenance of ecological balance in nature, we are once again back to the classical Greek tradition in this regard.

PLACE OF GEOGRAPHY IN CLASSIFICATION OF THE SCIENCES

The confusion regarding the place of geography in the context of the division of knowledge into systematic fields had continued to agitate the minds of scholars until the last quarter of the nineteenth century despite the fact that German philosopher Immanuel Kant (1724–1804) had cogently addressed this question in his twofold scheme of classification of knowledge: one logical and the other physical. Logical classification grouped individual items into separate classes on the basis of morphological similarities and similarity in the processes of origin. This was the basis of the division of knowledge into a series of systematic sciences (or "natural systems"). Such a grouping of items for study completely ignored considerations of place and time of occurrence of the phenomena concerned. Physical classification, on the other hand, grouped phenomena that belonged to the *same place* or *the same time*. Classification in terms of time is history, that in terms of space, geography. History reports on phenomena that follow one another in terms of time, and geography reports phenomena that exist together in horizontal space on the earth surface. Thus, history is narrative and geography a description. Together, the two fill up the entire circumference of human perceptions. Both are integrating disciplines, and for that reason, history and geography are bound together by mutual relation between time and space, despite the fact that their bases of integration—history, time; geography, space—are separate and apparently unrelated.

Reality is simultaneously historical as well as spatial in that the present-day phenomena occurring together in particular places on the earth surface represent the end product of processes of historical evolution. Likewise, all historical events had occurred in the contemporary contexts of place and space. Kant saw man and his works in intimate association with nature and he gave due recognition to man's role in modifying nature. As May (1970, pp. 147–151) has analyzed, Kant's concept of geography as the study of phenomena arranged in space, and of history as the study of phenomena arranged in time periods, represented a secondary division of his larger scheme of classification of fields of knowledge for convenience of academic treatment. The question of creating barriers between different branches of knowledge was furthest from his thought. For Kant, "Geography is an empirical science, seeking to present a 'system of nature', and is a law-finding discipline" (James, 1972, p. 144). In his book on *Critique of Pure Reason* (1781) Kant had clearly underlined mutuality of time and space relations when he stated that: "Space is not something objective and real,

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nor is it a substance or an accident, or a relation, but it is subjective and ideal, and proceeds from the nature of the mind by an unchanging law, as a schema for coordinating with each other absolutely all things externally sensed" (cited in Richards, 1974). Thus, Kant subscribed to the view of cognitive structuring of space by the human actor, so that for him there was no subject-object dichotomy and, by implication, time and space dualism.

This is indeed how geographers view their discipline today. The current generation of geographers shares a common concern with history in seeking full contextual explanation of phenomena occurring together in parts of the earth surface as the world of man. In this sense, geography is focused on the particular, and involves in-depth study of particular places so that it may appear idiographic in perspective. Geography simultaneously shares a common concern with other sciences in identifying the general laws of organization and behaviour through comparative analyses of particular types of phenomena (or relations) in different parts of the earth's surface. The general principles so identified form a major input in the comprehension of the geography of particular places. Geography is, therefore, simultaneously regional as well as systematic. The fundamental purpose of geography is to comprehend the earth as the world of man, so that "The history of geographical ideas is the record of man's effort to gain more and more logical and useful knowledge of the human habitat and of man's spread over the earth: Logical in that explanations of the things observed could be so tested and verified that scholars could have confidence in them; and useful in that the knowledge so gained could be used to facilitate man's adjustment to the varied natural conditions of the earth, to make possible modifications of adverse conditions, or even to gain a measure of control over them" (James, 1972, p. 4).

Geographical work involves seeking answers to three closely related sets of questions. These are: What is it? What is it like? What does it mean? The first relates to location, both absolute (i.e., in terms of latitudes and longitudes) and relative (i.e., in terms of accessibility of other known places). Location determines the spatial context in which things are placed—a context which to a great extent influences the precise character of its physical and human geography. Places in tropical latitudes have hot climate but places located on the western margins of landmasses experience a hot and dry climate while those on the eastern margins experience a hot and wet climate. Likewise, location in relation to cities and highways makes a lot of difference to the nature of place prosperity.

The second question relates to description of the observed phenomena in a given place. Since every point on the earth surface differs from every other point in microscopic terms, all observations and therefore, all descriptions are by nature partial rather than complete. Our observations are guided by the purpose of the investigation in hand, and are, therefore, always selective. Furthermore, observations are guided by preconceived images about phenomena made on the basis of previous knowledge. Mental images about phenomena are known as *concepts*, as distinguished from

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direct observations in the field which are called *percepts*. The former represent *theory* and the latter, *reality*. However, the mental structuring of the observer differs according to each person's cultural background and training. Accordingly, the nature of the reality presented by different observers may also differ. This poses an apparent paradox, since though concepts determine how the phenomena are perceived, they represent generalizations based on previous observations which may themselves have been guided by subjective images of reality. In academic practice, this paradox is resolved by the fact that:

> the trained observer is taught to accept a set of concepts in graduate school, and then sharpens or changes the concepts during professional career. In any one field of scholarship, professional opinion at any time determines what concepts and procedures are acceptable; and these form a kind of model, or paradigm, of scholarly behaviour. Such a body of doctrine determines what problems are considered worth investigating, what kinds of answers are professionally acceptable. But at all times, accepted concepts and procedures based on them are subject to challenge. Progress is achieved when one working hypothesis is replaced by another (James, 1972, p. 7).

The last question, "What does the observed phenomenon mean?", refers to its meaning in the context of the underlying premise of an orderly world—that is, of the universe conceived as a system of harmoniously related parts. In science, orderliness is accounted for in the recognition of cause and effect sequences taking place in accordance with some general law. Two different ways of representing cause and effect sequences are recognized: one deductive and the other inductive. The former proceeds from the general to the particular, and the latter follows the reverse path from the particular to the general.

THREE ESSENTIAL CHARACTERISTICS OF GEOGRAPHICAL WORK

Following Haggett (1994), three essential characteristics of geographical work may be identified:

1. Emphasis on *location*. In geography, we try to establish locations of phenomena on the earth surface accurately and economically on the map. Thus cartography (or mapmaking) is an essential tool for geographical work. Through our maps we disentangle different locational factors in order to delineate specific spatial patterns. By this means we also endeavour to propose more efficient or more equitable patterns in social and economic organization of everyday life.

2. Emphasis on *society-land relations*. Geographical study is by nature ecological in approach and perspective, so that it emphasizes interrelations between phenomena, links between different aspects of phenomena in the local natural environment and the people living in that particular segment of the earth surface. Here emphasis shifts from spatial variation of

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phenomena to the delineation of ecological links between the land and the people. This ecological relationship represents a kind of vertical bond. The relationship between the people and their habitat is a two-way affair: The environment influences human initiative, which in turn modifies the character of the natural environment so that the environment in particular places as we find it today is partly natural and partly the product of man's intervention. In this context it is pertinent to remember that the choice of *scale* is the critical element in geographical study since the scale of operation—local, regional or global—is what determines the overall perspective.

3. Emphasis on *regional analysis*. Regional analysis involves identification of regions, analysis of their internal morphology, their ecological linkages, and their relations with other regions near and far. Regional work involves two different but closely related approaches. In the one we focus on areal organization in particular places or areas with a view to gaining in-depth knowledge of the man-environment reality obtaining therein. The sum total of such studies focused on particular places in different parts of the earth surface may provide us valuable knowledge about the totality of the global man-environment system. Such studies are termed as *regional geography* and involve the "total aspect" analysis of particular places. In the second approach, the researcher may choose any particular theme or element of the system and analyze it systematically over the earth surface (or large parts of it) with a view to identifying the general laws of its distribution over the globe. This is called *systematic geography*. The two are complementary perspectives. Regional geography provides the raw material on the basis of which we proceed to identify the general laws of behaviour or organization which in their turn, illuminate future perspectives in regional study of particular places by introducing a comparative perspective in research.

GEOGRAPHY, A EUROPEAN SCIENCE

In the words of Stoddart (1986), what distinguishes geography as an intellectual activity distinct from other branches of knowledge is a set of attitudes, methods, techniques, and questions, all of which had developed in Europe towards the end of the eighteenth century. Stoddart dates this beginning to the year 1769, the year in which Captain Cook first entered the Pacific, and over a span of ten years before his death in Hawaii in 1779, he had charted one-third of the coastlines of the world. Cook's voyage was accompanied by some top ranking scientists, illustrators and collectors so that following the publication of the accounts of this expedition, empirical science had suddenly displaced old concerns in geographical writing wherein myth and imagination were difficult to separate from fact and reality. The common characteristic of all geographical writing before the year 1778, when J.R. Forster first published his account of the voyage under the title *Observations Made During a Voyage Around the World*, was that none of them was based on *direct observation*. Charting out of the observed phenomena required great deal of rigour and called for focused concern for realism in

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illustration and description since the maps and charts were required to provide precise information in order that they could correctly guide the course of navigators. Now on, "Places came to be seen as composed of objects which could be recorded and related to each other in an objective manner, rather than as triggers to mood and to expression" (Stoddart, p. 34). With a view to facilitating comprehension of the huge amount of new data about lands and peoples on the earth surface pouring in ever increasing waves from the voyages of exploration, twofold devices were developed. One was *classification*, of which the Swedish botanist Linnaeus (1707–1778) was the great pioneer, and the other was the invention of the *comparative method*.

The expanding frontier of knowledge about the lands and peoples on the earth surface, and the vastly improved comprehension of the mysteries of nature had simultaneously led to a changed attitude toward man and his place in the scheme of nature. It is the extension of the scientific method of observation, classification and comparison of peoples and societies that had finally made the rise of geography as the integrated discipline of the man-environment system possible. This changed attitude to man and his works had given rise, before the end of the nineteenth century, to empirical recording of the artefacts and ways of life on a global scale, as for example in Ratzel's *Volkerkunde* of 1885–88. Indeed, in his 1778 volume, Forster had recommended that "mankind ought to be considered as members of one great family; therefore, let us not despise any of them, though they be our inferiors in regard to many improvements and points of civilization".

Alluding to the foundation of geography as a modern discipline in the post-1769 period, Stoddart (pp. 36-37) drew attention to the fact that Humboldt was born in the year that Cook first entered the Pacific, and Ritter in the year that he died ten years later, and both Humboldt and Ritter passed away in the year 1859, the year in which Charles Darwin published his book: *The Origin of Species*. The achievement of Humboldt and Ritter (as the twin founders of geography as a modern discipline) "was to seize the technical and the conceptual advances of the Pacific voyages and so to organize and order knowledge as to show its coherence and significance, Humboldt ecologically, Ritter historically and regionally". However, "Neither Humboldt nor Ritter fully succeeded in their aims to demonstrate the fundamental congruity of man and environment" since "It was their misfortune never to know the key to nature which Darwin supplied, and which transformed nineteenth-century thought. Today, a century after Darwin's death on April 19, 1882, we *necessarily* see evolutionary order everywhere, with all things interrelated in time and space. It was a vision denied to critical observers, classifiers, comparers of the previous decades".

This scientific revolution in Europe coincided with social and educational upheavals that followed the Industrial Revolution. A new Act in 1870 had made elementary education compulsory in Britain. Similar

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laws were enacted in France and Germany. Institutions of higher learning proliferated and knowledge was getting rapidly compartmentalized into *subjects* or disciplines. Appointment of professors to head independent departments of geography in the 1870s symbolized "the new professionalism of those who called themselves geographers". These developments in the last thirty years of the nineteenth century have "determined the future organization" of geography just as the empirical reasoning and observation of earth's diversity over the preceding century had shaped its content.

A humanistic turn in the study of geography was slowly emerging. Studies in history and sociology were revealing common trends in the growth of civilizations from savagery to culture so that the supposed superiority of Europeans over other people in Africa, Asia and the Americas was proved to be false. It had greatly shocked the European elite when investigations showed that "at the end of the nineteenth century...working men in the East End of London had a vocabulary smaller than that of the Melanesian islanders.... This brought to general acceptance a new cultural relativism which had been completely absent when the first European voyagers set sail a century before" (Weber, 1974). This changed perspectivee–the humanistic turn—was pioneered in geography by Elisee Reclus (1830-1904), a student of Ritter and an anarchist geographer. His lead was kept alive by the Russian geographer Prince Kropotkin (1842–1921). It is true that many before these two had drawn attention to man's injustice to man including Humboldt in his celebrated essay on New Spain. However, the true significance of Reclus and Kropotkin lay in that they "were acutely aware of the need for social change...and social justice, and both devoted their lives to working for it".

To conclude, geography had emerged as a modern discipline as a consequence of Europe's encounter "with the rest of the world and with itself, with the tools of the new objective science, and all other geographical traditions are necessarily derivative and imitative of it. Quantification, perception and social concern—all were dominant concerns of European geography in its formative period just as they are today" (Stoddart, 1986, pp. 38-39). However, such a conclusion does not negate the fact that rise of geography as an autonomous branch of higher learning especially after 1871, the year which marked the rise of Germany as a great European power, was inescapably tied with the imperialistic/expansionist needs of the colonising European powers. Scientific study of geography was promoted because it provided valuable knowledge through the use of which the areas and populations in the non-European lands could be more efficiently controlled and exploited in order to contribute to general affluence in the mother countries (cf. Gregory, 1989, pp. 350-351).

GEOGRAPHY AND THE RISE OF THE SCIENTIFIC REVOLUTION

Nowadays it is fashionable to question intellectual rigour in geography and to speak of its formlessness and conceptual sickliness. However, this

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was not always so (Livingstone, 1992). History of science reveals that geographical exploration had played the central role in the rise of modern science: "Geographical exploration, with its associated skills in navigation and cartography, was...the principal field of human endeavour in which scientific discovery and everyday technique became closely associated before the middle of the seventeenth century;...hence its immense significance in the history of science and of thought" (Parry, 1981, p. 3). Geographical exploration represented the triumph of experience over authority—the fundamental ingredient in the emergence of experimental science. The experimental method, which the geographical explorations encouraged, "implied that men and women no longer had to believe what was said by eminent authorities; they could put any statement and theory to test by controlled experiment" (Cohen, 1985, p. 79).

THE DEVELOPING NATURE OF GEOGRAPHY

Though geography began as a modern discipline only around the turn of the nineteenth century, the themes that it deals with, have been the focus of scholarly attention since the dawn of civilization. From this point of view, each cultural realm had had its own historiography of geography (viewed in the sense of gaining more and logical and useful knowledge about the earth), but geography as a discipline pursued the world over in the current phase of history is the one that had developed in Europe over the past two centuries. Historiography of geography, in its broadest sense is, therefore, the European historiography traced in the continuing tradition since the time of ancient Greeks of the fourth and third centuries B.C. Since the Greeks believed that the position of planetary bodies exerted a controlling influence of man's life, scholars devoted a great deal of energy to the collection of data about the position of these bodies, leading to a firm tradition in mathematical measurement in the service of astrology. The great contribution made by scholars in the fourth and third centuries B.C. lay in that they had contributed to change emphasis from astrology to astronomy. This represented a great intellectual advance in that whereas in astrology, if observed facts disagree with the general theory, the facts are explained away as exceptional occurrences and the theory remains unchanged; in astronomy, on the other hand, if the observed facts differ from the general theory, the theory must be revised. This was the first foundation of the scientific method, and many of its basic procedures were laid by Plato (the great proponent of the deductive method) and Aristotle (who pioneered the inductive methodology).

Geographical work in ancient Greece had followed two distinct traditions. One was the mathematical tradition which was focused on fixing the location of places on the earth's surface, and the other was the literary tradition concerned with describing what was actually observed. Ptolmey's work presented a summary of the first type, and Strabo's that of the second. Expansion of the Roman empire had stimulated much interest in the pursuit

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of geographical knowledge without the use of which this large empire could not have been effectively governed. The fall of the Roman empire four centuries after Christ marked the decline of interest in geography. Following the rising influence of theocracy in the following period, the spirit of scientific inquiry was dulled since any attempt to question God's creation was viewed as blasphemy. No science (including geography) could flourish in such a climate of opinion. Inevitably, preeminence in geographical knowledge during this period had passed on to the Arabs who were then the leading trading nations and, therefore, traded far and wide. Many of the ancient Greek texts were translated into Arabic and thus the Greek tradition was also kept alive.

In Europe itself, however, things had begun to change for the better in the Age of Explorations beginning at the close of the fifteenth century A.D. Following the many exploratory voyages including those of Columbus and Vasco da Gama, geographical horizons of the Europeans had greatly increased, and in the period of territorial imperialism that followed, scientific knowledge about lands and the peoples on the earth surface became the most sought after intellectual commodity. Knowledge gained from the explorations was soon to lead to falling down of the stranglehold of theocracy, and concomittant rise of the spirit of 'academic freedom'—the right of scholars to seek answers to questions, to publish the results of their investigations, and to propagate what they believed to be true. The battle that was started by the likes of Leonardo da Vinci (1452–1519) and Nicolaus Copernicus (1473–1543) was finally won in the middle of the nineteenth century following the publication of Darwin's theory of evolution, which shattered the old tradition of thought guided by the concept of a created universe.

A major development in the pursuit of scientific knowledge had taken place in the seventeenth century. This related to the need for specialization and division of knowledge into separate fields, each focused on the study of a specific group of phenomena, or processes, and each guided by its own professional paradigm. This trend had reached its maximum development in the middle of the nineteenth century. In this separation of fields of knowledge the fundamental division was that between fields of study dealing with man and those focused on physical nature, including biotic phenomena. Under such a scenario, geography as a subject focused on the integrated study of man and the environment was faced with a crisis of identity. This crisis had coincided with the passing away of the twin pioneers of modern geography—Ritter and Humboldt—in 1859. Viewed thus, Ritter and Humboldt represented (in the words of James) "the culmination and conclusion of ancient scholarship". The following decade was a period of great disciplinary confusion. Many pleaded that geography should focus on the study of man whereas others maintained that geography should concentrate exclusively on the study of the physical elements of the earth's environment.

The basic question agitating the minds of geographers was: What was

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there left for geographers to do after aspects of nature and society were parcelled out to provide separate domains for a series of systematic disciplines? The crisis could be resolved only in the 1880s through the innovative visions of Ratzel and Richthofen, and a little later of Blache. In the post-1871 period, the sharper focus on acquiring geographical knowledge to facilitate colonial administration and international trade and commerce had resulted in the realization that both natural as well as social phenomena occur in particular geographical (spatial) contexts which to a great extent determine their precise nature. Many of the essential elements in these phenomena are caused by their association with all other aspects of the total environment whose complexion varies from place to place. To comprehend this varying reality of the man-environment system, geography was developed as the study of places wherein a variety of things and events were examined in their spatial context of unsystematic groupings. In the process of accomplishing the task of studying places, the geographical profession had also undertaken the task of bridging the widening gap between the natural and social sciences—a task for which the discipline's integrated focus on the totality of man and his environment eminently qualified it. The rising importance of geography to colonial government and the education of the citizenry greatly increased the prestige of this discipline so that independent departments of geography headed by professors were started in many European countries, most notably Germany and France. Inevitably, the scholars appointed to head these departments were people who had obtained training in other disciplines such as history, geology and biology, so that almost until the Second World War geographers remained busy trying to establish the status of geography as an independent discipline distinguished by its own concepts and methodology. The war had changed the context of progress in science and humanities.

In the postwar period, geography experienced all round development as its prestige as a useful branch of knowledge had been further enhanced owing to the valuable service rendered by geographers in course of the war as well as after it, particularly in the context of interdisciplinary work called for to resolve issues involving diverse skills in the study of nature and society. The geographers' locational perspective and their cartographic expertise had proved particularly useful. This led to liberal funding for geographical research and education. During this period, geography also greatly benefited from the development of the General System Theory (Bertalanffy, 1968) which offered new insights for the study of complex phenomena as representations of interconnected and interdependent elements. The application of the theory was greatly facilitated by the invention of the electronic computer, and by the revolutionary advances in data collection by satellites orbiting around the earth. Henceforth, the question regarding what geography does, and the attempts to answer it by drawing boundaries around it with a view to distinguishing it from other sciences, became irrelevant. In the changed climate of the postwar period, the process of separation of disciplines was replaced by "a process of

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integration in which each professional field brings its own special skills and concepts to bear on such major difficulties as poverty, overpopulation, race relations, and environmental destruction.... The special skills of geography are those related to the significance of location and the spatial relations of things and events.... A geographer is a person who asks questions about the significance of location, distance, direction, spread, and spatial succession. He deals with problems of accessibility, innovation, diffusion, density, and other derivatives of relative location" (James, 1972, pp. 13-14). (Short introductions to these concepts may be found in the various essays in Dikshit, 1994.)

This by no means implies that things have been quiet on the disciplinary front in geography over the past half century. Far from it. During this period, geography has experienced a number of revolutionary conceptual changes of far-reaching significance. In the immediate postwar period, a major convulsion had occurred in the form of what is generally known as the quantitative revolution, focused on mathematical precision in description and analysis, increased use of symbolic logic, change in emphasis from description to analysis, and from the study of the particular as unique to the study of the particular as the general case. This implied changeover from idiographic to nomothetic perspective in research. It also implied change in emphasis from areal organization and areal differentiation to spatial interaction with a view to generating theories of behaviour in space. Focus on spatial flows meant that geometry became the preferred language of research, and in that process postwar geography was transformed into the science of spatial analysis of social and economic phenomena. Simultaneously, new geography as a spatial science became increasingly focused on the study of spatial aspects of social and economic phenomena leading to progressive decline in focus on the study of physical environment. Thus, postwar geography is preeminently human geography wherein the study of the physical environment has value in that it provides the much needed background to the understanding of man's interaction with his environment leading to better appreciation of human ecology.

By the second half of the 1960s, however, it was realized that geography as a spatial science had become far too involved in identifying patterns and flows in abstract spaces and had, as a consequence, lost contact with everyday reality. This led to a general call for shift in focus from *spatial patterns* to *behavioural processes* that have generated those patterns. This new turn to geographical study is sometimes referred to as the behavioural revolution. Though the behavioural emphasis had opened up a psychological dimension in geographical work by emphasizing the role of cognitive and decision-making variables in mediating the relationship between environment and spatial behaviour, much of the work that actually followed was by way of an adjunct to geography as a spatial science. This tendency was soon countered by laying emphasis on the central (and active) role played by the human agency—human awareness, consciousness and creativity—in the process of man-environment interaction. Emphasis was

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laid on the understanding of meaning, value and human significance of life events. This heralded the rise of humanistic geography which emphasized the essential *subjectivity* of both the investigator and the investigated so that the studies conducted were idiographic and particularistic rather than law-seeking. Humanistic geography drew inspiration from the philosophies of social and human sciences, and it pursued the methodology of ethnography emphasizing the logical rather than the statistical mode of inference.

In the 1970s, following the general radicalization of societal perspectives in the West, *relevance* became the watchword in human geography (as in other sciences focused on the study of man and his social organization) so that the merit of any research now began to be assessed in terms of the degree to which it contributed to the understanding and resolution of some of the major economic, environmental, and social problems of the day. The relevance movement (some refer to it as revolution) differed from the earlier (postwar) focus on *applied geography* in that while the former was focused on the use of science and technology in social-spatial engineering with a view to increasing efficiency in the exploitation of resources and thereby contributing to economic prosperity; relevance research was, on the other hand, focused on rootedness of science in societal mores (i.e., the dominant perspectives of the day) and it made a focused attempt to introduce the concept of social justice in clear political terms in favour of the less privileged sections of society. Until the 1980s the movement had remained divided into those pursuing research under the public choice theory paradigm, and others who insisted upon radical Marxist perspectives. By the end of that decade the two perspectives had converged leading to more useful research outcomes. Also, clearly visible was a definite move toward rapproachment between the humanistic and the Marxist perspectives which had earlier been viewed as alternative paradigms of research. Thus, the post-modernist geography of the 1990s stands out as a unified discipline that combines the best of every tradition—regional and systematic, idiographic as well nomothetic, critical Marxist and humanistic. The current generation of human geographers subscribes to the consensus that what had appeared as conflicting perspectives in the course of the discipline's evolution in its formative phases had represented no more than different (but complementary) ways of looking at the totality of life in the world, so that each perspective had something valuable to contribute towards better comprehension of the great man-environment system, and thereby, toward equipping the researcher with better tools of research in the service of society.

ORGANIZATION OF THE PRESENT VOLUME

This book is designed to cover the entire conspectus of the history of ideas in geography, beginning with the ancient Greeks, though the primary focus is on the history of ideas in the modern period that began with Humboldt

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and Ritter toward the end of the eighteenth century. Chapter 1 is devoted to discussion on the First Foundations of Geography and covers the period from the ancient Greeks to the end of the eighteenth century. It includes discussions (besides, dealing with the contributions of the Greeks and the Arabs) on the Age of Exploration and its impact on the study of geography. Brief discussions on contributions of Varenius and Kant are included. Chapter 2 is focused on Geography in the Nineteenth Century: The Age of Humboldt, and covers the period from 1790 to 1859. It includes discussions on Humboldt, Ritter and Reclus and Guyot. The treatment of geography after Humboldt and Ritter is divided into two parts. The first part (Chapter 3) is focused on Developments in Germany in the context of the emerging crisis of identity in the discipline during the post-1859 period and the ways to resolve it. Attempts to project geography as an integrated discipline focused on the study of the man-environment system in ecological (Ratzel) and in regional or chorological terms (Richthofen) have been analyzed and explained. A brief discussion of the contribution of Schluter (who projected geography as the science of landscapes) is also included.Chapter 4 deals with the post-1859 developments in France (Blache, Brunhes, Vallaux, and Gallois), Britain (Mackinder and Geddes), Russia (Kropotkin), and the United States (Davis, Jefferson, Huntington, and Semple). Tomaintain continuity of thought, developments in American geography to 1950 are also included with a view to highlighting the contributions of Barrows and Sauer, and the rise of historical and applied geography.

The remaining chapters are focused on developments since World War II. Chapter 5 deals with the shift in focus from Areal to Spatial analysis in geographical work. Chapter 6 focuses on the rise of the Behavioural perspective and Humanistic geography. Chapter 7 is addressed to the Call for Social Relevance and Reorientation to Political Economy. Chapter 8 deals with the Regional Concept and the development of regional geography; Chapter 9 with Historical Explanation in Geography, and Chapter 10 is focused on the Impact of Evolutionary Biology on Geographical Thought, Chapter 11 on Geography and Environmentalism, and Chapter 12 on Place, Space and Locality as the dominant focus in current human geography research. Chapter 13 presents a brief discussion of the Geography of Gender whereas Chapter 14 is focused on Modern versus Post-modern Geographies. The book concludes with a short overview of developments over the past half century and the current phase of convergence and rapproachment in geographical perspectives (Chapter 15).

THE CONTEXTUAL APPROACH TO HISTORY OF IDEAS

As Wright (1926/1966) had noted long ago, history of geography is the history of geographical ideas. It is a repository of the changing views about the relationship between man and nature, so that it reflects the development of human consciousness in the course of man's experience in trying to

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comprehend the world around him (Berdoulay, 1981). Such a disciplinary history must necessarily emphasize the development of problems and theories in the context of the social and intellectual environment in which the protagonists of these theories had lived and worked. In such a history, the truth or falsity of any given proposition is no longer the primary concern. Instead, "we seek to understand how geographers as individual scholars recognized and grappled with intellectual issues in their time, in particular intellectual, social, and economic environments" (Stoddart, 1981). For such a history of geographical thought, the "origins and persistence of error in geography" (James, 1967) is regarded as enlightening as the history of wisdom, since many of these errors had provided the source of inspiration and context for further conceptual progress.

As Berdoulay (1981) has underlined, a contextual approach to the history of geographical thought is guided by four factors: First, we must remain conscious all through of the basic fact that, while there is a changing system of thought, simultaneously there is also continuity of thought in terms of certain basic ideas. The student of contextual history must always remain conscious of the fact there is no inherent dichotomy between internal and external factors influencing scientific change. The two represent a continuum and are equally important. Secondly, the contextual approach must not neglect any geographic trend though some of these may not have acquired any lasting recognition. In other words, the historian of ideas should guard against assigning superiority to one trend over another since the lack of success in the form of posterity may be essentially sociological or political. Thirdly, the identification for in-depth study of the major issues which concern a given society is necessary for understanding contemporary innovations in concept and methodology since science is socially rooted. Fourthly, as geographic trends are inevitably rooted in social context, it is important that the historian of ideas does not adopt a narrow concept of *scientific community*, since every scholar belongs to a certain *circle of affinity* which encompasses more than the scientific community in the narrow sense. The circle of affinity includes specialists of many disciplines as well as politicians and intellectuals with definite views on societal issues. Lastly, a contextual approach is less concerned with examining the possible influence of an idea and more with looking at the reasons behind the demand for, or use of, that idea. The novelty or originality of an idea (which when seen in isolation may not appear new or innovative to us today) is best explained in terms of the synthesis of a particular set of ideas held in society in the context of its place and time. To conclude, "The contextual approach... serves as a comprehensive framework for analyzing the conjunction of inner logic and content of science and the context in which the scientist is placed. It is by disentangling the links which unite change in geographic thought to its context that one is in the best position to assess, and to learn from, the creative contributions" of individual scholars (Berdoulay, 1981, pp. 13-14). This is the basic approach adopted in this book.

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The First Foundations: Developments upto the Eighteenth Century

In its wider connotation as a branch of knowledge concerned with the satisfaction of human curiosity about the lands and peoples away from one's home base, speculation regarding mysteries of the physical environment, and the role it plays in shaping the destiny of man upon the earth, geography is as old as human civilization. As such, each major cultural realm has had its own historiography of geography. Modern geography as practised all the world over today, represents, however, an outgrowth of the European geographic tradition so that the historiography of modern geography is essentially an account of the conceptual developments among Europeans regarding the nature of the earth and its environment and the way it influences man. Thus, the roots of modern geography are to be traced back to the thought of the ancient Greeks.

CONTRIBUTIONS OF THE GREEKS AND THE ROMANS

References to descriptive writings about lands and peoples in different parts of the earth's surface are found in the oral traditions of classical Greece and are reflected in the writings of Homer, whom the Greek geographers had themselves referred to as the father of geography. *Odyssey*, Homer's epic poem written sometimes in the ninth century B.C., presents geographical accounts of the lands and peoples located on the margins of the world then known to the Greeks. The poem records the wanderings of Odysseus to return to Ithaca after the fall of Troy, when he was blown off-course by a storm, and it took him twenty years to reach home. The poem contains a geographical account of the distant places visited by the hero of the epic in course of his long journey. In it there are references to a land of continuous sunshine, and later of Odysseus's visit to an area of continuous darkness. Apparently a Greek poet could not have imagined these scenes. Somehow accounts about the nature of the earth in the far north of Europe during the long summer days and the continuous winter darkness had filtered back to Greece, and were woven with other geographical threads into an enchanting adventure story. As in the case of *Meghdoot* of Kalidas, many have tried to identify the many places referred to in the epic poem.

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However, Thales of Miletus—a town located near the mouth of the Menderes river on the eastern side of the Aegean Sea (which was both a centre of learning and a flourishing centre of commerce)—who lived in the seventh and the sixth century B.C., is regarded as the first Greek to have devoted focused attention to the measurement and location of places on the surface of the earth. Thales himself was a very successful businessman. In the course of a business trip to Egypt, he had been greatly impressed by the geometrical traditions of the Egyptians in the measurement and computation of areas. He had introduced some of these ideas among the Greeks. Anaximander, a contemporary of Thales and a few years his junior, is credited with having first introduced the idea of the sundial consisting of a pole set vertically over a flat surface to measure the varying position of the sun by measuring the length and direction of the shadow cast by the pole. The shadow was shortest at noon and provided an exact north-south line for determining the correct longitude of the relevant place. Anaximander is also said to have produced a map of the known world with Greece as its centre. Thales and Anaximander have jointly been regarded as the originators of the mathematical tradition in geography in ancient Greece. The literary tradition in the writing of geography had also developed around the same time. Hecataeus, a resident of the town of Miletus, and born around 475 B.C.—about the time that Thales and Anaximander had passed away—originated the literary tradition and his book *Periods Ges* (Description of the Earth) is regarded as the first known attempt to synthesize available knowledge about the world in a usable form. Hecataeus is also one of the earliest writers of prose in classical Greek literature.

The next great name in this context is that of Herodotus (circa 485–425 B.C.) who is widely known as the father of history, but is also generally regarded as one of the founders of geography. His history of the Greek struggle with the "barbarians" included (as digressions) descriptions of various places visited by the author. Herodotus firmly believed that all history must be treated geographically and also that all geography must be studied historically. For him geography provided the stage, or the setting that gives meaning to historical events. Herodotus had travelled a great deal. Throughout his travels he had retained a keen interest in the nature of the landscape so that he not only described geographical phenomena but also tried to explain them. Examples include his attempt to explain the annual fluctuations in the flow of the Nile, and the processes involved in the origins of deltas occurring at the mouth of the Meander (Menderes) river at Miletus. Herodotus had no interest in the mathematical tradition and showed no interest in problems like measurement of the earth's circumference. He accepted the Homeric view of the earth as a flat disc over which the sun was believed to travel in an arc from east to west.

Plato (428–348 B.C.) also made an important contribution to the development of geographical ideas. Plato was a great proponent of deductive reasoning. He insisted that the observable phenomena on the earth's surface represent poor copies of ideas from which these observable phenomena

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had degenerated. By way of illustration he referred to the case of Attica (the ancient territory of which Athens was the capital). According to Plato, the area was originally very fertile and capable of supporting a large population of men and animals. He wrote that compared to its original state, the Attica of his time was "like the skeleton of a sick man, all the flesh and soft earth having been wasted away, and only bare framework of the land being left" (cited in Glacken, 1967, p. 121). Contemporary philosophers in Greece generally accepted the idea that symmetry of form is one of the essential attributes of perfection, and that the most completely symmetrical form was a sphere. It was argued that since the earth had been created to serve as the home of man, it must have a perfect form, and therefore it must be a sphere. Plato is regarded as the first scholar who put forward the concept of a spherical earth located in the centre of the universe, and the sun and all the other celestial bodies moving around it. Plato offered no argument or evidence as proof that the earth is round. Providing the proof for the spherical shape of the earth was left to Aristotle (384–322 B.C.), who was a student and a member of Plato's academy for twenty years.

Aristotle is regarded as the pioneer of inductive reasoning and the inductive approach to acquiring knowledge. He was convinced that the best method of building a reliable theory was to start with the observation of facts. This required reasoning from the particular to the general, in contrast to Plato's deductive approach which required the student to proceed from the general to the particular. Aristotle laid the foundation of what has been regarded as the world's first paradigm to guide research procedures. He laid down four fundamental principles of scientific explanation: First, it is necessary to establish the necessary characteristics (i.e., the nature) of the phenomenon being investigated; Second, it is necessary to identify the substance of which it is composed; Third, it is necessary to identify the process through which the phenomenon has attained its present form; and lastly, it is necessary to identify the purpose that the phenomenon concerned fulfils in the overall scheme of nature. This last principle makes Aristotle stand out as the first teleologist in that he believed that everything was changing in accordance with a preexisting plan.

Aristotle argued his propositions so convincingly that his research methodology appeared irrefutable at the time it was presented. His intellectual status in the contemporary world of scholarship was so high that his ideas were accepted without question for a long time. (Some of his ideas were patently false, however. One such was the idea that habitability on the earth surface is a function of distance from the equator, and that areas around the equator are too hot for human survival.)

Although Plato and Aristotle gave intellectual leads that contributed to the development of knowledge about the earth as human habitat, neither of the two could be identified as a geographer. As contrasted to this, Erastosthenes (276–194 B.C.) is often referred to as the father of geography as a branch of knowledge. He is said to have coined the word geography.

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The term is derived from *ge*, meaning the earth, and *graphe*, meaning description. Thus was born geography as a field of study which specialized in presenting reasoned description of the Greek ecumene, and speculated about the nature of peoples and places beyond the range of knowledge in contemporary Greece. He wrote the first formal text on geography entitled *Geographica*. His estimate of the earth's circumference was remarkably accurate, and, therefore had proved a major step forward in the development of knowledge about the earth. Erastosthenes was the chief librarian at the famous museum at Alexandria—a post that he occupied for about forty years until his death in 194 B.C. Under his leadership, the museum had developed into a major centre of astronomical research, a field of knowledge that was at that time viewed as closely associated with geography. Erastosthenes identified five climatic zones, one torrid zone, two temperate zones, and two frigid zones. He also improved upon the Aristotelian idea on this subject by giving latitudinal boundaries to the five climatic zones. The *torrid zone* extended 24° north and south of the equator, and the *frigid zones* extended to 24° from either pole. The areas in between were the two *temperate zones*.

After the death of Erastosthenes the post of chief librarian of the museum at Alexandria went to Hipparchus who was the first to divide the circle into 360 degrees. He also defined a grid of latitudes and longitudes for the earth, and identified the equator as a great circle that divides our spherical planet into two equal parts. Hipparchus pointed out that since the earth makes one complete revolution in 24 hours, it covers a journey of 360 degrees in a day and so covers fifteen degrees of longitude in one hour. He also made a significant contribution to the development of map projections by suggesting ways for overcoming the difficulty of representing the spherical earth on a flat sheet of paper.

The cartographical cosmographical traditions set by Erastosthenes and Hipparchus were further advanced by the succeeding generation of students at the museum. The cumulative knowledge gained through these exertions culminated in Ptolemy's (90–168 A.D.) eight volume work entitled *Guide to Geography*. Ptolemy was himself a great astronomer of his time and was the author of the famous text on classical astronomy entitled *Almagest* which had for long remained the most standard reference on the movement of celestial bodies. His *Guide to Geography* was also of related interest. By adopting the system of latitudes and longitudes based on the division of the circle into 360 degrees, he attempted to give precise location for all the known places in precise mathematical terms. Six out of the eight volumes of his *Guide to Geography* consisted of tables of latitudes and longitudes. The first volume was devoted to a discussion on map projections, and the eighth volume contained maps of different parts of the world showing all the places that had been included in volumes two to seven. It is true that from the perspective of the present, Ptolemy's book would appear as a monumental collection of errors. It was, however, a piece of great scholarship at the time when it was originally presented. Ptolemy's calculations of

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latitudes and longitudes are found to be wrong since these calculations had been based on estimated lengths of journeys between places; and these could never be accurate. Another major source of error was that Ptolemy had rejected Erastosthenes' almost correct estimate of the earth's circumference in favour of Posidonius's (which gave a figure that fell short of the actual by a little over one-fourth). (Erastosthenes had estimated the earth's circumference at 252,000 stadii, and Posidonius at 180,000 stadii—one stadium being equal to 157.5 metres.)

Strabo (64 B.C. to 20 A.D.), born a century-and-a-half before Ptolemy, had carried forward the tradition of topographical work of Greek geography as started in the works of Herodotus. His seventeen-volume work named *Geography* was largely an encyclopaedic description of the world known to the Greeks. Unlike the works of most other Greek scholars, Strabo's book was found almost intact. The first two volumes of his book contain a review of the work of other geographers since the time of Homer. They give a fair idea of the nature of geographical writing in ancient Greece. The next eight volumes were devoted to Europe, six to Asia, and one to Africa.

Strabo's book was written to cater to the needs of a specific group of readers, namely the officers of the administration, statesmen, and commanders of the Roman empire. The purpose was to provide a handbook of information about places and people to help the imperial officers in the better appreciation and accomplishment of their task. Strabo's book had laid down a clear foundation for chorological writing in geography. Explaining the method of writing geography, Strabo wrote:

> ... just as the man who measures the earth gets his principles from the astronomer and the astronomer his from the physicist, so too, the geographer must in the same way take his own point of departure from the man who has measured the earth as a whole, having confidence in him and in those in whom he, in his turn, had confidence, and then explain in the first instance, our inhabited world, its size, shape and character, and its relation to earth as a whole; for this is the particular task of the geographer. Then, secondly, he must discuss in a fitting manner the several parts of the inhabited world, both land and sea, noting in passing where the subject has been treated inadequately by those of our predecessors whom we have believed to be the best authorities on the matters (Strabo, trans., Jones, 1917, pp. 429-431; cited in James, 1972, p. 47).

Both Strabo and Ptolemy had lived at a time when the Roman empire was at its zenith. It was the largest centralized empire in history till that time. The state needed to have exact description of its territories as well as the other territories it interacted with. This knowledge was necessary both for effective administration and trade as also for the training of the younger generation from among whom the future crop of administrators was to be recruited. The work of the two Greek scholars, besides extending the frontiers of knowledge, was designed to meet a definite need of society. Geography was flourishing because it served a useful purpose.

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GEOGRAPHY IN THE MIDDLE AGES

During the fifth century A.D., the Roman empire suffered demise. The central administration had greatly weakened and consequently the constituent territories gradually became independent. As trade and commerce declined, the geographic horizons of the people rapidly narrowed down so that, with the passage of time, the geographical horizon of most people in Christiandom became confined to their immediate surroundings. Given the extremely narrow world-view of contemporary European societies, it was natural that religious orthodoxy should increase. Before long, scriptures had begun to be regarded as the ultimate repository of knowledge of every kind so that an impression was created that there was no need to learn anything outside the Holy books. Anything that did not conform with the "truth" of the scriptures was regarded as the product of a perverse mind and had, accordingly, to be rejected. Under these conditions, science (and, therefore, geography) could not develop and the Middle Ages represented the Dark Age in the history of scientific knowledge in Europe. During this long period, scientific concepts developed by the ancient Greeks were reshaped with a view to make them conform with the "truth" preached by the Church. For example, the idea of a spherical earth was abandoned in favour of the old concept of the earth as a flat disc, with Jerusalem as its centre. This dismal state of affairs continued almost until the end of the twelfth century A.D.

By the end of the eleventh century A.D., overland travel of Christian pilgrims to Jerusalem across Turkey and Syria had been made very difficult on account of Muslim domination over these territories. This aroused the religious sentiments of Christian Europe. A series of military campaigns were organized with a view to rescue the Holy Land of Jerusalem from the control of Muslims. Between 1096 and 1270 A.D., eight different crusades were organized for the purpose. These crusades (religious wars) played a major role in broadening the geographical horizon of Christian Europe. Men from different parts of Europe had come together to participate in them. These participants went back to their homes with new knowledge and information about the landscapes and customs of many areas beyond the range of the familiar. This stimulated interest in, and the urge to gain knowledge about, unfamiliar places. The religious wars, therefore, had led to a new beginning—a revival of interest in geography as a branch of knowledge. Expeditions began to be organized to distant places. The most famous of such expeditions was Marc Polo's voyage to China, the Far East, and the Indian Ocean undertaken between 1271 and 1295.

The Crusades proved a stimulant to the revival of interest in the study of peoples and places in far-off lands in another way also. Owing to the "religious" wars the Muslims had closed the overland routes to India and beyond to European merchants who had until then participated in the highly profitable spice trade between India and Europe. Attempts were, therefore, directed to finding an alternative route to the Indies. Two such attempts led to the glorious discoveries of Columbus and Vasco de Gama.

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GEOGRAPHY IN THE ARAB LANDS

The fall of the Roman empire, and the decline of scientific learning in Europe was followed by a period of great ascendancy in the Muslim world which, under the influence of Prophet Mohammed, had been transformed from a multitude of tribes divided by intertribal feuds into integral components of a larger all-inclusive identity based on adherence to a common set of religious beliefs and practices. The followers of Islam soon embarked upon a course of conquest of the world outside Arabia with a view to spreading the new religious ideology to the farthest corners of the world. Persia and Egypt were conquered in 641-642 A.D., and by A.D. 732 the whole of the West Asian desert region was under their control. They soon overran the Iberian peninsula and Spain and Portugal remained under Muslim rule for almost nine hundred years. Muslim influence also extended eastward into India and parts of south-east Asia. The act of holding on to such a huge politico-cultural empire had, in itself, become a major stimulant to the rise of interest in geographical learning. The Arabs held a monopoly over the spice trade between India and Europe. This trade required a great deal of travel over land and sea. Travels between places spread over such a large expanse of territory became the source of considerable extension of knowledge about geographical environment in tropical regions.

Following the widening of its geographical horizon, the Arab world became fired with a new zeal for scientific learning. Baghdad (founded in 726 A.D.) became a major centre of learning. Its rulers (the Caliphs) employed learned men of different faiths to make authentic translations of the major scientific works of their respective languages. Included in these works were books on astronomy and geography. Scholars were also employed to calculate the circumference of the earth, and to fix latitudes in the plain of the Euphrates. The method employed was the one used by Erastosthenes about a thousand years earlier. Available texts on geography written by the ancient Greeks (including Ptolemy) were translated into Arabic, and new texts were got written after duly incorporating the new knowledge derived from the records of observations made by Arab merchants and explorers.

Thus, as a result of Ibn-Hakul's voyage to the south of the equator (made between 943 to 973 A.D.), the wrong notion regarding the inhabitability of the torrid zone (as perpetuated by Aristotle) was abandoned. Around the same time, in course of his travels down the east coast of Africa upto the Mozambique, Al-Masudi had reported the phenomenon of monsoonal winds. Another contemporary named Al-Maqdisi had established (in 985) the general truth that the climate of any place is a function not only of its latitude but also of its position on the east or west side of a landmass. He is also credited with the knowledge that most of the earth's landmass lies north of the equator. Al-Idrisi (around 1099–1180 A.D.) made many corrections to Ptolemy's book. On the basis of the new information collected by Arab explorers, and some collected from other sources, he produced his own book on geography (in 1154) in which the Greek idea about the Indian

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Ocean as a closed sea was corrected. Also corrected were the positions of many rivers including the Danube and the Niger.

Another great Arab explorer was Ibn Batuta (1304--1368 A.D.). He extensively explored regions of North Africa and West Asia, sailed along the Red Sea, and travelled south along the east coast of Africa to Kilwa, a point about 10 degrees south of the equator. He had reported that an Arab trading post was located in the latitude of 20 degrees south thereby confirming the habitability of the torrid zone. Ibn Batuta had also travelled overland from Mecca to Persia, Bukhara and Samarkand, and from there across Afghanistan to Delhi. He had visited several islands, including Ceylon (Sri Lanka), Sumatra, and the Maldives. He also visited China and returned to Fez, the capital of Morocco, in 1350 A.D. From there he travelled across the Sahara to Timbuktu on the Niger, gathering valuable information about Black Muslims on the way. He settled down in Fez in 1353 A.D. after travelling an estimated 75,000 miles, a world record for his time. On the request of the king of Morocco, he put down a detailed account of his travels for posterity.

The last great Muslim scholar who contributed significantly to the development of geographical knowledge was Ibn-Khaldun (1342--1405 A.D.) who wrote (in 1377) a detailed introduction to world history published under the title *Muqaddimah*. In his introduction to the book he identified two sets of influences on man's progress (i.e., history): One, the physical environment, and two, the social environment derived from culture and belief rather than the natural environment. This distinction between the two sets of environmental influences on man was a remarkable intellectual achievement for his time so that Kimble (1938) was prompted to remark that Ibn-Khaldun had "discovered...the true scope and nature of geographical inquiry".

Ibn-Khaldun had concentrated on the study of the tribe and the city—the two most important elements in the political organization of the desert society in the Arab world. He identified the tribe and the city as two distinct stages in the evolution of social organization in a desert environment. While the nomads represented an earlier (primitive) stage of social organization, the city dwellers represented the last stage in the development of social life, almost the point where decay sets into the social organization owing to the sedentary lifestyle of the urban community. Many credit Ibn-Khaldun with having presented in this way one of the earliest concepts of the life cycle of the states. Surprisingly, however, Ibn-Khaldun had clung to the Aristotelian idea about the inhabitability of the equatorial regions. To the great credit of Ibn-Khaldun is the fact that he was the first great scholar to direct attention specifically to the study of the man-environment relationships.

The significance of Arab contribution to the historiography of modern geography lies in that the development of geographical knowledge in the Arab world represented, in some ways, a further development over the original base provided by the geographers of ancient Greece, whose works

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had been translated into Arabic, and widely used by Arab scholars. Thus, while Europe itself had forgotten the Greek heritage in geography, the Arabs had held the banner aloft and it was largely through contact with the Arab world, and the translation of their books (including retranslation of Greek works from the Arabic translations) that geography got revived as a living science in fifteenth century Europe. Indeed, the countries having the closest contacts with the Arab world, such as Spain and Portugal, spearheaded the series of exploratory voyages that ultimately opened the way to the revival of interest in geographical learning. Large parts of Spain and Portugal had remained under Muslim rule since the eighth century A.D. While Portugal had become free in the middle of the thirteenth century, the Spaniards pushed out the Muslims gradually from the peninsula through a series of efforts lasting over a century from 1391 to 1492.

Both the Portuguese and the Spaniards had mastered the art of shipbuilding and navigation, and had launched ambitious programmes of voyages of exploration with a view to promoting trade and commerce with the outside world, particularly the spice trade with the Indies, and trade in gems and precious stones with parts of Africa south of the Sahara. Since the overland routes in each case were then under the control of the Arabs, it was necessary to find alternative sea routes, which contemporary science had shown to be well within the pale of possibility in view of the round shape of the earth, and the continuity of the oceans.

The importance of the spice trade for contemporary Europe lay in that owing to the inadequate supply of sugar, spices were required to make food palatable. Besides, in the absence of refrigeration, meat was to be stored in dried and salted form. Such meat required spices in order to be made reasonably palatable. What was more, Genoa and Venice which had earlier been flourishing centres of trade in spices from India and beyond, were now deserted as the Arabs had blocked direct contact between Europe and the regions of supply further east in Asia.

THE AGE OF EXPLORATION

Portugal's Prince Henry "The Navigator" who had (in 1415) succeeded in capturing the Muslim base at Ceuta on the southern side of the Strait of Gibraltar, took the first initiative toward wider exploration across the high seas. From his Muslim prisoners, the Prince had learnt that many of the most valuable items of merchandise traded in European markets by the Arabs were brought from areas in Africa to the south of the Sahara. This inspired him to sponsor sea voyages of exploration along the western coast of Africa. Around this time—in 1410—two important publications had appeared in geography. One was the Latin translation of Ptolemy's *Geography* made from a copy preserved in Byzantium (Istanbul), and the other was a book called *Imagine Mundi* authored by Pierre d'Ally in which he presented a summary of various geographical writings then existing in the countries of Christian Europe. The two were very influential in promoting interest in

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geographical knowledge and created a favourable climate for the launching of voyages of exploration, and for developing better techniques of cartography and map design.

Prince Henry was responsible for establishing a broad-based institute of geographic research at Sagre near the port of Lagos where a rich library of all the available literature in geography, cartography, astronomy and related subjects was stocked, and scholars (including linguists) from all parts of Europe were invited to teach Portuguese students the art of navigation, and to inform them about the existing knowledge regarding the earth and its environment in different parts of the world so that suitable preparations could be made to meet the contingent situations likely to be encountered in the process of exploratory voyages then being planned for the exploration of the western coast of Africa, and to find an alternative route to the spice islands beyond India. These explorations initiated by the Prince laid firm foundations for the larger ventures by subsequent explorers under the patronage of the royal house of Portugal, culminating in the great voyage of Christopher Columbus (who discovered the new World in 1492) and the discovery of an alternative sea route to India by Vasco da Gama in 1498.

Columbus had studied at Sagre, and he had been greatly influenced by Pferre d'Ally's *Imagine Mundi* which had suggested that since the earth was round, a route to China and India could be found by sailing west from the Canary Islands. It is a different matter though that in the process of finding an alternative route to the Indies, Columbus landed in America rather than Asia, his intended destination. Columbus died in 1506 still believing that he had discovered a part of Asia. The task of finding an alternative route to Asia by sailing west and then north along the coast of South America was accomplished by another great Portuguese explorer three decades later in October 1520. This voyage was performed by Magellan whose name the (Magellan) Strait connecting the Atlantic with the Pacific now bears.

Voyages across the sea required maps and charts to guide the sailors in course of their travels. Ptolemy's map was used in the beginning. It was the task of the royal cartographers to correct the old map in the light of new information then available. Thus, Venice and Genoa soon emerged as great centres of cartographic learning. European sailors and merchants departed from either of the two port towns for their journeys to the eastern Mediterranean to pick up the cargo brought by Arab ships from the East. The first globe showing the earth as a sphere was produced by Martin Behain in 1490, and map projections tackling the problem of representing the round earth on a flat sheet of paper began to receive attention of scholars soon after. In 1530, Peter Apian produced a heart-shaped map of the earth in which both latitudes as well as longitudes were shown as curved lines. Neither distance nor direction was represented correctly, and the map showed only one hemisphere. Apian's student, Gerhard Kramer (who later adopted the name Gerhard Mercator) made a world map in 1538 by joining two

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heart-shaped projections for each hemisphere. Mercator earned celebrity in 1569 when he succeeded in designing a projection that showed the whole of the earth surface on a single network of latitudes and longitudes. This was the famous Mercator Projection—the orthomorphic cylindrical projection. As we know, even though theoretically an orthomorphic projection, it greatly distorted the shapes of continents, but its great advantage lay in that on it compass bearings could be shown by straight lines so that navigators could plot their course without being required to draw cumbersome curves. The projection could not be easily used until English geographer Edward Wright (1558–1615) produced the trigonometric table to reproduce the projection. This improvement made the Mercator projection universally accepted for maps on which to base navigators' charts.

Focus on improvements in cartographic techniques continued through the sixteenth and seventeenth centuries. New projections were devised and old map projections improved upon. Map makers remained busy revising old maps in the light of new information obtained from travellers and explorers. From the time of Magellan (who explored the outlines of South America between 1518 to 1521), and James Cook (1728–1779) (who through his three different voyages, performed between 1768 to 1779, drew the outlines of the Pacific Ocean and eliminated the possibility of the existence of Ptolemy's Southland), scholars were directly addressing the task of drawing correct outlines of landmasses and water bodies. They were also busy devising techniques of surveying and cartography to be able to present true-to-scale reality of the earth's surface on their maps and charts. This task was almost complete by the time of James Cook's death in 1779 and a good deal of new information about world climates, wind regimes, distribution of flora and fauna, and patterns of human civilization over the earth surface had been obtained. Incorporating the ever increasing information and data with a view to presenting a correct and meaningful description of the earth surface had become a formidable task. The challenge posed by the problem attracted a number of leading scientists to the study of geography.

While explorers were busy fixing the outlines of continents and oceans, and cartographers remained busy in drawing more accurate representations of the earth surface on maps, the world was experiencing a great revolution in knowledge about the nature of the universe and the earth's position in it. The old-time concept of the earth as the centre of the universe was abandoned in favour of the concept of a heliocentric universe first put forward by the Polish scholar Nicolaus Copernicus in 1543. The concept was further refined by Kepler (1571–1630) in 1618 and Galileo (1564–1642) in 1623. Galileo further revolutionized scientific thinking by formulating the concept of mathematical order in the universe—i.e., an order in which relationships between phenomena could be described in terms of mathematical laws rather than verbal logic. A further scientific advance came in the form of Newton's law of gravitation in 1686. Thus, in the course of a century and a half, seeds of scientific revolution had been

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sown. These heralded the beginning of the rise of specialized branches of knowledge, each focusing on some particular theme, object, or relationships between phenomena. The rise of specialized systematic sciences, each focusing on a particular category of facts or relationships signalled the demise of the era of universal scholarship and of cosmographies in which scholars had attempted to bring together all that was known about the earth and its parts in single volume works in the style set by Strabo.

In view of the rapid flow of new information derived from the increasing stream of explorations and scientific research, compilation and synthesis of knowledge in a meaningful manner became an increasingly challenging task that required a high degree of scholarship. The cosmographers of that period were, therefore, far from mere popularizers. The first great cosmographer of the age of exploration was the German scholar Sebastian Munster (1489–1552) who had been engaged, with the help of 120 other authors and artists, in writing a broad-based cosmography incorporating the latest information on every important aspect for over eighteen years. The outcome was a six-volume work entitled *Cosmographie Universalis* published in 1544. Written in the tradition of Strabo's *Geography*, the book earned its author the popular title of "the German Strabo". The first volume of Munster's cosmography presented a general picture of the earth on the lines of Ptolemy's *Geography*, while the remaining five volumes were devoted to descriptive accounts of the major divisions of the earth's surface.

Munster's work was a combination of tradition (imaginative stories about people and places which were part of popular belief) and science (incorporating new information derived from explorations and scientific investigations). Thus, his account of America and Africa included stories of men with heads on their chests, and having a combined animal and human form. Such beliefs were part of contemporary scholarship and consequently, Munster's volumes were avidly read necessitating several editions between 1544 and 1550; and the book remained a popular reference for about a century thereafter. Another leading cosmographer was the German scholar Cluverius (1580–1622) who had published a six-volume compendium on universal geography (following the general plan of Munster's work but better informed) in 1624. The first universal geography to appear in the English language was written by Nathanael Carpenter (1589–1628) a scholar at Oxford, who had benefited from his association with Cluverius during the latter's frequent visits to Oxford. Carpenter's book had appeared in 1625, a year after the publication of Cluverius's book.

From Cosmography to Scientific Geography: Contribution of Bernard Varenius

In course of time, the tradition of writing cosmographies got concretized into a coherent body of knowledge that came to be described as "general geography". *Geographia Generalis* (1650) of Bernard Varenius (1622–1650) (a Dutch scholar) was an outgrowth from the cosmographic tradition even

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though it is rightly regarded as a major step forward toward laying the foundation of scientific geography. Varenius's book was, according to Dickinson (1969), the first work "which sought to combine general, mathematical, and physical geography and chorology". Varenius set forth clearly the distinction between two forms of geographical scholarship—the one concerned with the description of particular places (i.e., regional description), and the other concerned with developing general laws and hypotheses of wider applicability. He termed the first Special or Particular Geography (i.e., geography of particular places etc.) and the second as General Geography.

Varenius was writing at a time when voyages of exploration were pouring in a flood of new information and data so that one of the major problems facing contemporary scholars was how to relate specific pieces of information to general principles. Among geographers, Varenius was the first to focus attention on this problem; and the solution that he offered through his *Geographia Generalis* was to become the basic tenet of geography as a branch of knowledge which has ever since retained a twofold division into Regional and Systematic (or General) geography—the former focused on the study of particular places, and the latter was devoted to the study of the nature, and pattern of spatial distribution of particular items of geographical interest over the earth surface and its parts.

The most creditable part of Varenius's contribution lay in that he underlined the relationship between the two streams of geographical scholarship: Special geography provided the results of in-depth study of particular places and regions which became the raw material (the data) on the basis of which General geography could pursue its task of depicting spatial patterns of distribution, and inferring therefrom general hypotheses and laws explaining why they occur where they do, and thereby providing valuable inputs for better work in the area of Special (i.e., Regional) studies. Varenius pointed out that while Special geography was of great practical value in the pursuit of government and commerce, General geography provided information on the principles governing the distribution of particular phenomena on the earth surface so that the administrator and the businessman may be suitably informed about the nature of the environment they are likely to encounter in particular parts of earth's surface. To Bernard Varenius, therefore, General and Special geography did not suggest a dichotomy or a separation of ways, and division of objectives. To him, the two represented mutually interdependent parts of geography as a unified field of scientific learning. In this vision of geography, Varenius was far ahead of his peers. This explains why he had so greatly influenced the concept and scope of geography in Europe for well over a century.

In the foreword to his book, Varenius had set out a plan for Special geography, according to which the description of particular places should be based on celestial conditions, including climate; terrestrial conditions, including relief, vegetation and animal life; and human conditions including trade, settlements and forms of government in each country being studied.

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It is true though, that Varenius was none too enthusiastic about human geography since its subject matter could not be put to exact mathematical analysis for purposes of generating laws of behaviour (Gettfried Lange, 1961, paraphrased in Holt-Jensen, 1980, p. 14).

Like most other great works of scholarship, Varenius's book had been inspired by the demands of his time. In 1647, Varenius had accepted the position of a private tutor in a family in Amsterdam, then the commercial hub of the Netherlands. Here he came in contact with merchants engaged in international trade. Many of the merchants needed information about Japan where the Dutch had established a trading post in Nagasaki. This is what had inspired his first book entitled *Regional Description of Japan and Siam* published in 1649. The experience gained in writing a regional geography of Japan gave Varenius the idea that descriptions of particular places "could have no standing as contribution to science so long as these are not related to a coherent body of general concepts". His *Geographia Generalis* was written with a view to promoting the search for and the building of this much-needed conceptual coherence in geographical scholarship. His book went through several editions in Latin—two of these (published in 1672 and 1681) edited by no less a person than Sir Isaac Newton. An English edition was published in 1693 (Baker, 1955a and 1955b).

Varenius passed away in 1650 at the tender age of 28 so that the world of scholarship was deprived of many more conceptual leads. Underlining the methodology of Special vis-a-vis General geography, Varenius pointed out that while in General geography (dealing mostly with phenomena of physical origin), most things can be proved by mathematical laws, in the case of Special geography, with the exception of celestial features (i.e., climate), things must be proved by experience that is, by direct observation through the senses (James, 1972, p. 226).

THE IMPACT OF DISCOVERIES

New Answers to Questions about the Origin of the Earth and Its Surface Features, and Man's Place in Nature

Speculation about the origin of the earth, and man's place in the web of nature, had for long remained constrained by theocratic domination of thought in mediaeval Europe. Intellectual thinking had continued to be conditioned by traditions inherited from ancient Greece as well as from biblical accounts. All this began to change during the seventeenth century when steps were initiated to cut the thought process loose from the strangle hold of biblical beliefs, and to start experimenting with rational methods, so that geographical exploration had "immense significance in the history of science and of thought" (Parry, 1981, p. 3).

By the end of the seventeenth century, a good deal of speculation on the origin of the earth had led to the belief that the earth is a physical phenomenon that has acquired its present form though natural processes

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of change spread over millions of years, and that it was wrong to regard it as a divine creation. Inspired by the theory of comets given by Edmond Halley (1656–1742) in 1682, William Whiston (1667–1752) developed the theory that the earth was made from the debris of a comet, and that the gravitational pull of a second approaching comet had caused the elliptical orbit of the earth around the sun, and had led—through the tidal waves caused by its gravitational pull—to the creation of the continents and ocean basins. While the crests of the waves were occupied by landmasses (continents), the troughs became the ocean basins. Later the German scholar Abraham Gottlob Werner (1749–1817) developed the theory that the great flood that had been caused by the cooling of the earth's atmosphere, had led to dissolution of materials of the earth's crust. The dissolved materials of the crust were deposited on the surface of the earth in the form of a series of layers so that large parts of the earth surface are covered with sedimentary strata.

Simultaneously, a good deal of speculation had begun on the origin of landforms. In 1719, John Strachey (1671–1743) showed that landforms reflected the rock structure lying underneath them. Subsequently, in 1777 Simon Pallas (1741–1811) published geological maps to show that the cores of most mountain ranges are made of granite. Alongside, ideas about the mechanics of river flows and valley development were being developed at a rapid pace. The French scholar Louis Gabriel Comte Du Buat (1734–1809) mathematically explained (in 1786) how the flowing water of a river can establish equilibrium between velocity and the load of sediment being transported by it. This had led to the idea of "graded river profiles". During the 18th century James Hutton (1726-1797) popularized the concept of uniformitarianism, according to which the processes that shape the earth surface indicate a perpetual process of change "with no vestige of a beginning and no prospect of an end".

New methods of scientific classification of plant and animal life were also influential in shaping geographic thought and practice. The most influential figure in this field was Swedish botanist Carolus Linnaeus (1707–1778). He developed a system of classification based on classes, orders, genera, and species. French naturalist Lamarck (1744–1829) drew attention to the need for a system of classification of plants and animals in accordance with their natural characteristics. He challenged the widely believed notion that plants and animals were created in their present form. Thus, he presented the rudiment of a theory of evolution that was later advanced and refined in a big way by Darwin and others who laboured to explain the mechanism through which the process of evolution of life forms had taken place. Coupled with the idea of uniformitarianism of Hutton, the theory of biological evolution had greatly impressed geographers about the role of time in the evolution of landforms.

The early part of the eighteenth century also witnessed the first beginnings of scientific study of man. The German scholar J.P. Sussmilch (1707–1767), in a book published in 1741, had demonstrated the existence

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of statistical regularities in population data. His research showed that the ratios between the sexes had remained nearly balanced, and that birth and death rates could be predicted on the basis of past trends. (However, the idea that numerical information about individuals tends to group around averages (in accordance with the theory of probability) was put forward by Lambert Quetelet (1796–1874) only much later in 1848.)

As knowledge about the lands and peoples over the earth's surface increased, so did speculation about the role of the environment in shaping human behaviour patterns. French philosopher Jean Bodin (1529–1596) was one of the first to present a major work on this theme in 1566. Placing belief in the Greek concept of climatic zones, Bodin formulated the theory that people in the southern parts of the world (being under the influence of Saturn) are religious by nature; those living in the northern regions (living under the influence of Mars) were endowed with martial characteristics; and only people living in the middle regions (owing to the influence of Jupiter) were able to evolve a civilized way of life and live under the rule of law. English geographer Nathanael Carpenter in his *Cosmography* (1625) further advanced Bodin's idea regarding climatic zones and their influence in shaping human behaviour. From these early beginnings of what may appear to us today as unscientific speculation about the man-nature relationships, progressively evolved more rational scientific analyses based on detailed observations and comparative case studies. In a piece published in 1719, the French scholar Abbe de Bos established a definite relationship between the weather and suicide rates in the cities of Paris and Rome. His analysis showed that in Paris, suicides were most common in the period before the onset of winter and just after the end of winter. In Rome on the other hand, most suicides had occurred in the two hottest months in summer (Glacken, 1967, pp. 556–558). Until the 19th century the most influential scholar who worked on this theme was Charles Louis Montesquieu (1689–1755). In line with the scientific ideas current in his time, Montesquieu wrote that warm climates favoured growth of despotism and slavery, whereas colder climates encouraged democracy and freedom so that, according to him, democracy tended to increase in direct proportion to increase in distance from the equator. Despite these crude observations on the relationship between man and the environment, Montesquieu was far from a crude determinist (Kriesel, 1968); he had given due allowance to human initiative and technology in reducing environmental constraints to human progress.

The progress in scientific thought through the newly acquired habit of questioning everything in sight represented a new tradition in scholarship. As James (1972) wrote, all these efforts were "new" in the sense that they offered new hypotheses, new methods of classification, and new ways of making use of mathematical principles of explanation. In the development of this new way of thinking, the ground breaking work was performed by the French scholar Count Buffon (George Louis Leclerc, Comte de Buffon, 1707–1788), who was director of the Jardin du Roi botanical garden in Paris

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from 1739 to 1788. By virtue of the position that he held, Buffon had access to a large collection of specimens of plants and animals, and to descriptions written by travellers and explorers. His forty-four volume work on *Histoire Naturelle, Generale et Particuliere* (1749–1804) (written in active collaboration with a large number of scholars) "represents one of the first works resulting from the reports of voyages of discovery in which attention was turned from oddities and marvels to a search for regularities and for the laws governing processes of change. His approach was nonmathematical and ... strictly inductive ... aimed at finding some kind of order in the flood of new information" obtained from the explorations and discoveries (James, 1972, p. 136).

While Buffon subscribed to the idea of a divinely created earth, he rejected the theory that the final plan of creation was in the mind of the creator and as such there was no need to look for causes of earth phenomena. Buffon was the first to focus attention on man as an agent of geographic change. He developed the idea that the earth has been cooling gradually, and that part of the warmth on the earth surface was derived from its hot interior. Buffon subscribed to the theory of climatic determinism inherited from the ancient Greeks but he was positive that man was not a passive agent, and that he was capable of adjusting to any climate through his technology and culture.

Inclusion of panels of trained scientists in the voyages of discovery, beginning around the last quarter of the seventeenth century, had greatly promoted scientific knowledge about the earth. The first such scientific traveller during 1698–1708 was the English astronomer Edmund Halley (1656–1742), the great scientific genius at deriving order out of complex data. He was the originator of the mortality tables in 1693, as also of many graphic methods for showing geographical distribution of physical features of the earth. His maps and discussions of the trade winds of the Atlantic (1686) provided the first illustration of wind directions and wind shifts. He also prepared the first map of magnetic variations using isogonic lines in 1701.

The father-son team of Johann (1729–1798) and George (1754–1794) Forster had accompanied Captain James Cook on his second voyage to the Indian and the Pacific oceans. In the course of this voyage, the two made botanical observations. It was in the course of this voyage that George Forster found out that the patterns of temperature on the eastern and western margins of landmasses are very different so that there was similarity between the climates of Western Europe and the western coast of North America. George Forster later played the pivotal role in attracting Alexander von Humboldt to geography. Another great scientific traveller of this period was Major James Rennel (1742–1830). He was one of the founders of the science of oceanography, and had served as the Surveyor General of India during 1767–1777. His *Atlas of Bengal* (1779) had gone through several editions, and it had remained a standard work of reference until around 1850.

The growing spirit of inquiry had, by the last quarter of the eighteenth

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century, egged on many scholars to seek scientific answers to the age old questions regarding man and his life upon the earth. A most prominent name in this regard was that of Thomas Robert Malthus (1760–1834) who published his famous essay on population in 1798 in which he set out his theory about the interdependent relationship between increase in population and food supply. He noted that population increases in geometrical progression whereas food supply grows only in arithmetical progression. As a result, population keeps on increasing until subsistence level is reached, so that its further increase is checked by famine and epidemics. At one place in his essay Malthus had used the phrase "struggle for survival", a term which, several decades later, was to inspire Charles Darwin (1809–1882) in his explorations toward the theory of evolution of species through the process of natural selection. In his studies Malthus had showed that increase in agricultural production could not cope with the natural increase in population, irrespective of technological inputs. He was also the first to formulate the economic law of diminishing returns from increased employment of capital and labour.

THE NEW GEOGRAPHY OF THE 18th CENTURY

The greatly increased information about the lands and peoples around the world that had accumulated by the middle of the eighteenth century, called for a new style of geographical writing. Around this time the old descriptive geographies (cosmographies) were being replaced by more scientifically informed "universal geographies". Of several such universal geographies the two best known titles were authored by the French geographer Philippe Buache (1700–1773) and the German philosopher Anton Friedrich Busching (1724–1793). In a book published in 1752, Buache developed the theory that the earth surface is marked off into a series of major basins bordered by continuous ranges of mountains forming drainage divides between adjoining basins. This concept was greatly popularized through the effort of another German geographer Johann Christoph Gatterer (1727–1799) who identified these drainage basins as "natural regions" and used them as the basic framework for writing new geography texts. The theory became so popular in Britain that river basins were adopted as the preferred units for the study of areal integrations. (Buache is also said to have been the first to identify the existence of a land hemisphere with Paris as its centre.)

Busching had published a six-volume work on Europe in 1792. The work was organized in terms of political units, in the style of Munster, but was based on updated information. He died in 1793 so that his plan to write geographical accounts of the remaining continents remained incomplete. He was the first scholar to have used population density as a geographical factor, and was perhaps the best known geographer of his time.

Of the many universal geographies to appear in the eighteenth century perhaps the most influential was the one authored by the Denmark-born (but banished from that country in 1800) French geographer Conrad Malte-

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Brun (1775–1826). His universal geography was an eight-volume work that was published over the 1810–1829 period. Malte-Brun's work was far better organized than the works of his predecessors. His first volume had started with a discussion of the history of geography. The second volume contained discussions on general concepts including the origin of the earth, types of map projections, catastrophism, and uniformitarianism. He rejected the theory of climatic determinism. The most creditable feature of Malte-Brun's book was that throughout it he had incorporated the latest information derived from the accounts of various voyages of discovery, including that by Captain Cook.

PLACING GEOGRAPHY IN THE CLASSIFICATION OF SCIENCES: THE CONTRIBUTION OF IMMANUEL KANT

German philosopher Immanuel Kant (1724–1804) was a contemporary of Malte-Brun. He was professor of logic and metaphysics at the University of Konisberg. He had lectured there since 1755 on a variety of subjects, and since 1756 had regularly offered a course of lectures on physical geography every year until 1796. His attraction to geography was by way of his interest in explorations for the acquisition of empirical knowledge, as part of his general philosophical research. However, finding that geography was inadequately developed, and that it was lacking logical organization, "he devoted a great deal of attention to the assembly and organization of materials from a wide variety of sources, and also to the consideration of a number of problems" (Hartshorne, 1939, p. 38).

Kant's lasting contribution to geography is that he provided a philosophical foundation for the subject as a field of scientific enterprise. It was Kant's practice to expose in his introductory lecture the place of geography among the fields of scientific learning. He pointed out that there are two different ways of classifying phenomena for purposes of academic study. In the one, phenomena are grouped according to their nature (i.e., their inherent characteristics), and in the other, according to their position of occurrence in time or space. The first type of classification of the fields of learning was called *logical* classification, and the second was termed as *physical* classification. Logical classification gave us a series of systematic sciences, each devoted to the study of particular kinds of phenomena or activities. Fields of study like the various branches of natural and physical sciences such as botany, zoology, physics, chemistry etc., as also economics, political science, and sociology, derived their place as autonomous branches of study on this basis. On the other hand, physical classification provided a scientific basis for the historical and spatial sciences—the former concerned with the arrangement (or positioning) of phenomena in the time dimension, and the latter with arrangement of phenomena in the space dimension. Grouping things of diverse character and origin together on the basis of areal association in a horizontal space provided the subject matter of geography (in relation to the earth surface)

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and astronomy (in relation to celestial space). Grouping of phenomena of diverse origin and nature in terms of their arrangement in a time sequence provided the subject matter of history. In short, geography studies phenomena which lie side by side on the earth surface, and is, therefore, preeminently a *chorological* (i.e., areal or spatial) science. History, on the other hand, studies phenomena which are arranged in a sequence of time periods and is, as such, a *chronological* science. As Kant pointed out, both history and geography are essentially descriptive in approach, history being a description in a time dimension, whereas geography is description in a space dimension.

In Kant's scheme of division of fields of knowledge, geography occupied an important place. Owing to this, Kant is repeatedly cited by geographers in regard to justification of the status of their discipline as a science. Hettner's exposition of geography as chorology in the beginning of the twentieth century had closely followed the line of argument pioneered by Kant (even if he actually came to know about the existence of Kant's lectures at a later date). Hartshorne's *Nature of Geography* (1939) also followed the line of thought first formalised by Kant. Through Hartshorne's book this became the dominant concept of geography as a field of learning until around 1960 (May, 1970).

Contemporary scholarship in geography has been critical of Kant's view in that it is "impossible, and to some extent philosophically untenable, to draw such sharp divisions between the 'sciences' as Kant did. The systematic sciences study phenomena with reference to time and space and it is very difficult to separate time and space in studies of human geography" (Holt-Jensen, 1980, p. 15). Geographers are quite often required to study areal phenomena in terms of their transformation over time, and persistence of the past into the present. Likewise, historians cannot neglect spatial patterns in their study of time sequences and past periods. However, Kant cannot be blamed if his logically sound scheme of classification of sciences, and the place of history and geography in it, was used in a way that created barriers between fields of learning. As discussed in the Introduction (p. 4) Kant himself did not subscribe to the idea of any such barrier. His was a great pioneering thought and remains as valid today as it was at the time it was presented.

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Geography in the Nineteenth Century: The Age of Humboldt, 1790-1859

Kant's association with geography, and his attempt to locate it in the classification of sciences, gave respectability to the discipline as a scientific enterprise, but geography had been only marginal to Kant's intellectual pursuit as a philosopher. He had, nevertheless, prepared the ground and provided the point from where a new beginning could be made. This task was taken up and most competently accomplished by another German scholar, Alexander von Humboldt (1769–1859), a most versatile and prolific scholar and scientist whose researches had enriched several branches of science including geology, mineralogy, botany, earth magnetism and meteorology. Scientific societies all over Europe recognized him as an outstanding scientist of his time so that he was variously referred to by his contemporaries as the "monarch of sciences" and "the new Aristotle". A widely travelled individual of his time, Humboldt made singular contributions to theory and practice of geography so that many regard him (along side Carl Ritter) as the founder of modern geography. In many ways the nature of his contribution to geographical thought and practice represented, in the words of Preston James, both "a beginning and an end"—the beginning of modern style geography as an analytical science having its own methodology and way of looking at phenomena horizontally arranged on the earth surface; and the end of old style cosmographical geography—part science and part fiction.

In order to have a proper appreciation of Humboldt's contribution to the development of geography as a science, it is necessary first to summarize the intellectual cross-currents at the end of the eighteenth century, cross currents which had influenced his education as a scientist, and in reaction to which he had developed some of his own ideas and concepts, including his methodological approach to the study of geography.

SCIENCE AND PHILOSOPHY AT THE END OF THE EIGHTEENTH CENTURY

Through the eighteenth century, with the increased growth of industrialization and rapid expansion of European empires, science had become

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increasingly identified with progress in the sense that by extending the frontiers of knowledge, science had provided mankind with powerful tools for gaining mastery over the forces of nature wherever these appeared to hinder his onward march to greater progress. In accomplishing this, science met two major objectives of Enlightenment—the widening of man's mental horizon through rational thought, and facilitating human progress through technological advancement. As such, science became widely accepted as the means of intellectual liberation.

Since the new science was based on sense-experience and experiment, by the second half of the eighteenth century, it had become closely identified with "materialism" and "objectivism" (i.e., study of matter and objects). Each field of natural science became progressively more and more specialized in the study of its own particular circle of facts, so that few attempts were made to promote integrated world views. Indeed, universalism was viewed as opposed to the specializing spirit of science. The doctrine of facts and scientific objectivity, the two pillars of the emerging empiricist/positivist science, led to "claims of independence of scientific method from history and philosophy alike, while assertions of the amoral status of science were affirmed more strongly as the patent immorality of colonial and industrial society became the target of a movement for reform" (Bowen, 1981, p. 175). Some of the more important ideas and beliefs that had dominated the world of scholarship during the Age of Enlightenment may here be briefly summarized.

Positivist Model of Science and the Doctrine of Facts

The Comtean positivism of the early nineteenth century had its beginning in the age of enlightenment of the eighteenth century so that many regard David Hume as "the real father of positivism". To the philosophers of Enlightenment, the empirical method with its emphasis on sense-experience appeared as a suitable weapon in their own struggle against superstition, metaphysics, inequality, and despotism. During this period, the word *fact* (derived from the Latin root *facere*, meaning make or do) came to mean not action but some primary observation based on direct sense-experience. Thus, empiricism became identified as the "doctrine of facts". In the introduction to his *Histoire Naturelle* Buffon (1707–1788) had explained this doctrine by stating that truth in the physical sciences "rests on facts alone...a succession of similar facts constitutes the essence of physical truth". The truth derived from a large number of particular observations represented, according to Buffon, "only a probability, but a probability so great that it is equivalent to certainty. In mathematics we make suppositions, in physical sciences we propound and establish: In the first, there are definitions, in the second there are facts; we go from definition to definition in the abstract sciences, we proceed from observation to observation in the real sciences; in the first we arrive at evidence, in the second, at certainty" (Buffon, cited in Bowen, 1981, p. 175). Thus, the doctrine of facts was based on what has been termed as the *sensationalist approach* to knowledge. The approach is

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called sensationalist since all human experience could be traced back to individual sensations recorded by one or the other of the senses. Since acquisition of knowledge in the empirical model of science was through the study of the particular, or particles, this approach had also sometimes been known as the *atomic approach*.

Scientific Materialism and the View of the World as a Machine

Scientific materialism was the view of science that investigated the world as being composed of material facts—an idea that has been traced back to the Roman philosopher Lucretius (95–55 B.C.) who had claimed that it was the action of atoms rather than divine creation that had been responsible for the formation of the world including the whole range of living beings (plants, animals and man). This idea had received a fresh lease of life after Galileo and Descartes advocated the materialist theory of science according to which the world was viewed as a functioning machine. Only the human mind was regarded to be exempt from the operation of the mechanistic laws. The view of the world as a machine later received support from the works of Newton, so that in the course of the eighteenth century, efforts had begun to be made to include man in the materialist model of explanation. The original idea of Lucretius was more fully developed by the French scholar La Mattrie (1709–1750) in his book entitled *L'Homme Machine* (*Man a Machine*) in which he had interpreted materialism to include all forms of life. He argued that matter is the basis of life, and organized matter in complex bodies produces purposive motion, including human thought. He rejected the notion of divine order.

La Mattrie's ideas were further developed by d'Holback in his *Systeme de la Nature* (1770); and in the work of the French humanist Diderot (1713–1784) who accepted the materialist interpretation of the universe as purposeless and subject to mechanical laws and chance, and rejected the concept of divine order and emphasized that man makes his own morality in accordance with human physiology and needs.

The Historical Method and the Belief in Progress through Knowledge

One of the major concerns of the philosophers of enlightenment was progress through knowledge. They emphasized the nature of man as a social being as well as an individual, and drew attention to the function of science in society as part of a general improvement in education, happiness and virtue for humanity. This led to interest in the study of the history of development of knowledge and of the historical method of analysis.

A most distinguished example of the use of the historical method of analysis and explanation was presented in Adam Smith's (1723–1790) *The Wealth of Nations* (1776), a book that was later to earn him the title of the "Father of modern economics". Smith's method consisted of seeking clues from past experiences in different societies to find explanation for and better understanding of problems in economics. By combining the historical

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method with the statistical tradition of "political arithmetic", Smith founded the first of the new set of sciences dealing with civil and moral aspects, and thereby focused attention on the need for a more liberal interpretation of the scientific method. Smith's book demonstrated how the objectivist particularism of empirical science could be employed in the study of human groups by supplementing it with the knowledge derived from past experience through the use of the historical method. He expanded the scope of the empirical method of science to include the study of historical examples.

By the end of the 1780s the philosophic movement of Enlightenment was losing its coherence, and Baconian empiricism had gained ascendency in the study of the natural sciences. In the revival of positivist empiricism, the pivotal role was played by Antoine Lavoisier's (1743–1794) French language text entitled *Elementary Treatise in Chemistry* published in 1789. With a view to making chemistry an exact science, he advocated that the student of science should draw conclusions only from experience and experiment, and that he should rely on observations as the only source of ideas. He rejected any concern with the history of previous enquiry as irrelevant to further research. Lavoisier, therefore, incorporated a strong anti-historical approach into the positivist model of the exact sciences.

Leibniz and the View of the World as an Organism

Leibniz (1646–1716) rejected the materialistic/mechanistic view of the world. He maintained that it is impossible to find principles of *a true unity* in matter alone or in that which is only passive, since everything in it is only a collection or mass of parts of infinity. He emphasized that a continuum cannot be composed of points (material atoms); matter itself must be composed of parts that are pulled together by active centres of force somewhat analogous to the soul in the human body. As Crocker (1969, pp. 11-12) has pointed out, Leibniz thus introduced the concept of a dynamic, pluralistic universe, which is continuous but changing. He also introduced the idea of the world as an organism (as contrasted to the idea that the world was like a machine) in which the whole is greater than the sum of its parts. Nevertheless, Leibniz was an advocate of rational empiricism so that he accepted the need for an organized programme of experiments and observations in science. His opposition was only to the materialistic-mechanistic view of the world and not to the empirical method *per se*.

The organismic world view of Leibniz was adopted for the study of plants and animal life by a group of life scientists generally known to belong to the vitalist school. Later on, under the inspiring lead given by the English philosopher Herbert Spencer (1820–1903), the model was used as a methodological device in the study of social organizations.

It is relevant to note the contrast between the lines of approach adopted by Carl Linnaeus (1707–1778) and Buffon. Linnaeus supported the idea of fixity of species, and existence of discrete classes of plants and animals—a view quite consistent with the static and mechanistic view of nature. As

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contrasted to this, Buffon's Natural History favoured the idea of continuity of nature as advanced by Leibniz. Though he accepted the need for classification, Buffon was opposed to the system of discrete classes, since he had found that in botany a number of plants stand out as anomalies in classification.

The Idea of Evolution

The idea of progress through gradual change adopted in the study of species in evolutionary biology derived inspiration from the idea of progress in the works of some earlier writers, but focused attempts in this direction were made only by Erasmus Darwin (1731–1851) and Jean Baptiste Lamarck (1744–1829). In the case of geology, the evolutionary view of development was clearly proposed by Buffon in the first volume of his Natural History published under the title *Theory of the Earth* in 1749. The idea was later put forward in a forceful manner as the doctrine of uniformitarianism by James Hutton (1726–1797) in his *Theory of the Earth* published in 1795. The theory of social and intellectual evolution of man through gradual improvement in education and science was repeatedly emphasized by the philosophers of the period of enlightenment. The cumulative effect of all this was that the idea of the earth as a divine creation was abandoned and replaced by the theory that the earth had come into its present form through progressive change over a long period of time.

ALEXANDER VON HUMBOLDT

Universally acclaimed as the father of modern geography, Alexander von Humboldt (1769–1859) was one of the foremost intellectuals of his time. A versatile researcher, he had enriched several branches of science through original research. Humboldt lived at a time when under the impact of the empiricist/positivist view of science, scientific research had started to be treated as a specialized pursuit so that each researcher tended to confine his interest to a given branch of study. The lines dividing the several branches of science were yet to get hardened, however. Besides, knowledge was as yet not so highly specialized that a keen researcher could not master more than one field of science. Given his training and background (and of course his talent), Humboldt was eminently qualified to do so. His versatility as a scientist, and his expertise in several fields of science related to the study of the earth's environment had drawn him to geography—a subject that was subsequently to become his major area of interest, and to which he gave a sound philosophical basis as a field of learning through incremental advances over the work of his predecessors like Varenius and Kant.

Humboldt's stature as a leading figure in several branches of science, and his firm grounding in the philosophy and method of new science, eminently qualified him to play the role of the father figure of modern geography as a scientific enterprise—a synthetic but systematic discipline with a focused regional perspective.

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Humboldt's Career as a Scientist and His Ideas Regarding the Nature of the Universe

Alexander Humboldt was born in 1769 into the Prussian aristocracy. His father, an officer in the Prussian army, died when Alexander was only ten years old and he was brought up and educated under the stern guardianship of his mother who provided the best available education for her two children. Their early education was under the charge of private tutors at home in Tegel and near Berlin. In 1787-1788 Alexander went to study at the University of Frankfurt, but after only a six-month stay there, he returned home at his mother's instance, to study factory management in Berlin only to leave it in 1789 to study physics, philosophy and archaeology at the University of Gottingen. It was here that he met George Forster under whose influence he developed a lasting interest in field observation and the study of plants.

Humboldt accompanied George Forster on a hiking trip down the Rhine to the Netherlands and from there by ship to England. As he was to acknowledge later in his career, this trip initiated him to the study of the phenomena of nature in relation to each other and to their environment, and thence to the fundamentals of geography. George Forster (1754–1794) had accompanied his father Johann Reinhold Forster (1729–1798) on Captain Cook's second voyage lasting from 1772 to 1775, and had translated his father's account of the voyage, first published in 1777 under the title: *Observations Made During a Voyage Round the World.* The German translation had appeared in 1778. As Peschel (1865) wrote, Reinhold Forster was "the first traveller to give a physical survey of the section of the world he had seen, and the first to perform the highest function of a geographer, that of scientific comparisons" (cited in Dickinson, 1969, p. 18). Commenting upon the craze for collecting facts among his contemporaries, the senior Forster wrote: "Facts were collected from all parts of the world, yet knowledge was not increased", because the collection of facts represented "a confused heap of disjointed limbs, which no art could reunite into a whole." He stressed the need for a scientific observer "to combine different facts and to form general views from thence, which might...guide him to new discoveries". Plewe has described him as "the first German methodological geographer in the modern sense".

George Forster shared his father's views and advanced them in his own writings. Commenting upon his German languages book entitled: *Views of the Lower Rhine* (based on travels made in the company of Humboldt in 1789) Plewe has commented that through this book George Forster "founded more securely his father's method, and prepared the way for a systematic development of regional geography". In his *Kosmos,* Humboldt has acknowledged George Forster as his friend and teacher, and has stated that "Through him began a new era of scientific voyages, whose aim was the comparative study of peoples and regions"

The Study of Plant Organisms in Relation to their Habitat

Humboldt had left Gottingen in 1790 to pursue research in natural sciences.

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In accordance with his mother's wishes, he first joined an academy of commerce in Hamburg to prepare for a career in finance. There his subjects of study included (besides commerce) botany, minerology, and geography. After spending only a year at the commerce academy he shifted to the Freiberg Academy of Mines where he studied under the renowned geologist A.G. Werner (1749–1817). Here also, alongside geology and minerology, Humboldt continued to pursue botany. From his researches and experiments on underground plant life in mines, resulted a major Latin language work entitled *Florae Fribergensis* "in which he showed a characteristic concern not only with plants themselves but also with the relation of these as organisms to their environment". In the introduction to this book he had suggested that *geography of plants* should form an essential part of what he called *Geognosia* in Latin, and translated as *Erdkunde* in German (a term that later became the synonym for geography). Plant geography, he wrote,

> ...traces the connections and relations by which all plants are bound together among themselves, designates in what lands they are found... This is what distinguishes geognosy from... zoology, botany, geology, all of which form part of the investigation of nature, but study only the forms, anatomy, processes etc. of individual animals, plants, metallic things or fossils.

Thus, as Bowen puts it,

> in scope and method, Humboldt's *Geognosia* of 1793 can be regarded as providing an important model for modern geography. His idea of plant communities, extended to a study of the distribution and relation of rocks and animals, suggested the basis for a new science, one concerned with the interrelationships of organic and inorganic phenomena on earth. (Bowen, 1981)

Influence of Goethe and Schiller and the Idea of Harmonius Unity in Nature

In 1794, Humboldt visited Jena to be with his brother. Here he came in contact with Goethe and several other leading lights of the Weimar Society of writers and idealist philosophers, including J.C.F. von Schiller, J.G. Fichte and F.W.J. Schelling. In their *Naturphilosophie* this group favoured the "neoplatonic idea of polar forces in the universe", so that they were opposed to the mechanistic and materialistic view of science. They emphasized, instead, the need to look for unity and harmony in nature. This fundamental idea of the world of nature as an organic structure struck a sympathetic chord in Humboldt, since he had himself been drawn to similar ideas in his study of nature in the course of his field trip with George Forster, and his subsequent writing on plant geography. However, Humboldt did not share with Goethe and Schiller their distaste for the experimental-empirical approach to science. He saw no contradiction between an organic (anti-mechanistic) view of the world and the empirical/experimental method of acquiring knowledge.

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Toward the Development of Universal Science

Soon after the publication of his research on underground plants in 1793, Humboldt had written to a friend about his plan of a twenty-year project to study plant life on the earth surface "in connection with the whole of the rest of nature, along with its influence on sentient mankind". Two years later, he changed his mind in favour of a still more positive view of the unity of phenomena in nature. As he wrote to his friend Pictet in 1796, in the six years since his travel to England in the company of George Forster, he had made extensive field observations in the mountains of Europe and had studied nature from different points of view; these field observations had led him to conceive the "idea of a universal science (*physique du monde*)", but "the more I feel its need, the more I see how slight the foundations still are for such a vast edifice". His plan was to develop such a study on an experimental basis specifically "to reduce experiments to general laws, to establish harmony among the phenomena" (cited in McPherson, 1972). Thus the basic idea that finally impelled him to write his monumental *Kosmos* half a century later, had already germinated in his mind in the mid-1790s.

The development of universal science had, however, to wait until scientific observations and experiments on different aspects of the physical earth had yielded sufficient insights and material for compilation. With a view to fulfilling his ambition to establish the *physique du monde,* Humboldt plunged into a wide variety of scientific research. His book entitled *Aphorisms on the Chemical Physiology of Plants* was published in 1793. In it he had adopted the latest approaches to empirical research, and had also incorporated Lavoisier's teachings in analytical chemistry and his theory of "exact science". In 1797 were published the results of his experiments with electricity in the study of animals. He had experimented with the idea of stimulating the nervous system of various animals with the help of electrodes. The results were published in a two-volume German language text on *Experiments with Irritated Muscles and Nerve Fibres.*

During 1792–1796 Humboldt held an appointment in the Prussian ministry of mines. On the basis of his excellent performance, he quickly advanced many rungs on the ladder of promotion, but his heart was not in government service. He yearned for a career as a scientist. When his mother died in 1796 leaving him an estate yielding a high enough income to support his scientific activities, he quit his job to be free to start a career of scientific travel and exploration.

In 1797 he went to Vienna to prepare for an expedition to the West Indies. From Vienna he went to Paris where he met a number of eminent scientists at the *Institute de France.* He met the French botanist Bonpland in consultation with whom he prepared their plan for travel through Spain to Madrid in order to seek permission for a scientific voyage to the Spanish territories in South America. They set off in June 1799. This was the most ambitious scientific voyage undertaken to that date. The objective was to collect scientific data on all possible aspects of nature including place location

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and altitude so that his luggage included all kinds of available instruments for making and recording observations. Commenting on the objective of his voyage to a friend he wrote:

> I shall collect plants and fossils, and I shall be able to make astronomical observations with some excellent instruments; I shall analyze the air by chemical means... but all this is not the principal object of my voyage. My attention will never lose sight of the harmony of concurrent forces, the influence of the inanimate world on the animal and vegetable kingdom (cited in Bowen, 1981, p. 221).

Thus, the purpose of the voyage remained the fulfilment of his ambition to lay the foundation of universal science based on the concept of essential unity of organic and inorganic nature.

Scientific Explorations in South America (1799–1804)

Humboldt's travels in the tropical regions of South America began at Cumana in Venezuela. From there the two travellers went to Caracas, explored the settlements, and proceeded to the basin of Valencia (about 50 miles southwest of Caracas) in which lay a shallow lake of the same name. Here they made valuable observations on physical consequences of deforestation on the physical landscape and local economy. In 1800, the two travellers mapped some 1725 miles of the Orinico River and in that process established irrefutable proof against Buache's theory of continuous mountain chains, since in terms of that theory the Orinico should have been separated from the Amazon by a mountain chain. Humboldt's survey confirmed the earlier report that one of the channels of the Orinico in its upper reaches flows into the headwaters of the Rio Negro and through it into the Amazon (an early example of river capture). Throughout their arduous journey through tropical forests, the two travellers collected a large number of specimens of plants and fossils.

In November 1800, they returned to Cumana and from there sailed for Cuba. In 1801 they sailed for Colombia and arrived at the port of Cartegena from where they proceeded to explore the Andes in Colombia, Ecuador, and Peru throughout making elaborate records of altitudes, temperatures, and latitudes and longitudes at a series of places. On the basis of these records, Humboldt succeeded in providing a scientific description of the relations of altitude and air temperature to vegetation and the nature of agriculture in tropical mountains. From his study of volcanic rocks in the Andes, he was convinced that A.C. Werner's theory of the sedimentary origin of all rocks was wrong, and that granites, gneisses and other crystalline rocks had a volcanic origin. The twosome also climbed the Chimborazo mountain in Ecuador (which was at that time believed to be the highest peak in the world) in June 1802, scaling an altitude of 19,286 feet. (Chimborazo is 20,561 feet high and was finally conquered by the British mountaineer Edward Whymper in 1880). In course of climbing the mountain peak, Humboldt made observations regarding the effect of altitude on human physiology.

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After reaching Lima, Humboldt travelled along the Peruvian coast and there investigated the chemical properties of guano (bird droppings), sent samples to Europe for further examination leading subsequently to its commercial export as fertilizer. During his journey from Callao to Guayaquil in Ecuador he kept records of temperature changes in the ocean waters and was the first to describe movement of ocean waters (i.e., currents), including the phenomenon of upwelling of cold water from below. His observations of temperature changes in the ocean waters confirmed the existence of a cold current along the Peruvian coast. Humboldt named it the Peruvian Current though it is often referred to as the Humboldt Current.

In March 1803, the two explorers sailed from Guayaquil to the port of Acapulco in Mexico (then known as New Spain) which by virtue of its status as the principal colony of the Spanish American Empire (then the largest in the world) was at the peak of prosperity. Humboldt collected data on the geography and economics of the colony, including the latest population statistics. This later formed the basis for Humboldt's regional account of Mexico. In 1804 the two had reached Habana in Cuba. From there, they sailed to the USA. They met Thomas Jefferson in Philadelphia, and on June 30, 1804 started on their return journey.

Scientific Publications Based on the Voyage Data: Maturing of Humboldt as the Foremost Scientist of his Age

Back in Europe from his South American journey, Humboldt first returned to Berlin but he soon realized that the environment in Germany at that time was not conducive to his pursuit of scientific research, particularly after the defeat of Prussia by Napoleon in the battle of Jena in 1806. In 1807 he got the opportunity to visit Paris on a diplomatic mission, and decided to stay on there for the next 19 years. It was in Paris that the thirty volumes of his work *Voyage aux Regions Equinoxiales du Nouveau Continent* were published (between 1805 and 1834). In the introductory volume of the series, Humboldt underlined that his objective in reporting the results was not only to portray the "great phenomena that nature presents in these regions". The central objective was to understand the nature of their *ensemble.* He explained that the series was an extension of a study plan originally conceived in 1790 in the course of the field trip with George Forster. He wrote: "The study that I have made of many branches of physical science has served to extend my first ideas. My voyage to the tropics has provided me with valuable material for the physical history of the globe". As regards the scope of his research, Humboldt observed that it "encompassed all phenomena of nature that are observed both on the surface of this globe and in the atmosphere that surrounds it". He emphasized that his geography of plants was an essential part of his universal science, since it "considers vegetation in relation to local association in different climates".

In the volume on the geography of plants in the voyage series, Humboldt wrote that his primary objective was "to unite into a single picture the whole complex of physical phenomena in the equatorial regions".

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Also included in this picture was "man and the effects of his industry". For Humboldt, there was no dichotomy between the physical and the human aspects of nature in the study of *geognosia* (geography). His volume on New Spain "stands as a significant contribution to the field of human geography, and even today in the new era of social activism and advocacy research it remains an outstanding model" (Bowen, 1981, p. 230). With the help of elaborate statistics Humboldt presented a strikingly succinct picture of the effects of unequal distribution of wealth and productivity in the Spanish colony. "This was" according to James (1972, p. 159) "one of the world's first regional economic geographies, dealing with resources and products of a country in relation to its population and political conditions".

Volumes XXVIII to XXX of the series, entitled *Relation Histoire du Voyage* (translated into English as *Personal Narrative*) contained a detailed report on the scientific problems investigated and the results achieved. These volumes made an enormous impact on the world of scholarship. In his preface to these volumes Humboldt had written that his aim in his diverse scientific exertions was "to throw light on a science which had scarcely been outlined and which is called vaguely enough by the names of *Physique du Monde, Theorie de la Terre* or *Geographie Physique*". This volume was so highly regarded by contemporary scientists that Charles Darwin, read and reread the account and, according to his own statement, it had changed the course of his life. As Preston James (1972, pp. 158-159) has noted, "For a world emerging from the first shock produced by the impact of discoveries, Humboldt's books were like a fresh breeze because they were filled not only with excitement of travel in strange places, but also with reports of careful scientific investigation, the seeking of answers to questions about the interconnections among phenomena grouped together in rich diversity on the face of the earth". Through these volumes Humboldt became a great celebrity in science, and people from far and wide came to meet him in Paris.

Apart from being a great scientist, Humboldt was also a great humanist. In his regional studies he frequently drew attention to the prevalent social injustices. Apart from such a concern shown in his 1811 study on Mexico, in the third volume of *Relation Histoire* (and the last in the voyages series) he included essays on Venezuela and Cuba. In the "Political Essay on the Island of Cuba" he drew attention to the fact that 83 per cent of the population was coloured and 50 per cent of them were slaves. He warned: if "the condition of the coloured people does not soon undergo some salutary changes…political power will pass into the hands of those who have strength to work, the will to be free, and the courage to endure long privations. This bloody catastrophe will occur as a necessary consequence of circumstances". In order to properly appreciate the humanist stance of Humboldt, it must be remembered that in writing on this issue, he was lending the weight of the foremost scientist of the time to the cause of the underprivileged, and was thereby setting an example for other scientists and scholars to engage in crucial issues of social change at a time when conservative ideas had reigned supreme. It may be relevant to recall that

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almost exactly a century-and-a-half separated Humboldt's essay on Cuba and Zelinsky's iconoclastic Presidential address to the Association of American Geographers in 1975 that made a fervent call for geographers to pay attention to questions of societal relevance in research, and to focus on the problems of poverty and social justice in a spatial context. Humboldt's essay represented a rare example of scholarly boldness in face of the repression of democratic and reformist aspirations then going on in Prussia. As a political fallout of Humboldt's humanist writing, his elder brother (a supporter of the movement for constitutional monarchy) had to leave the Prussian ministry in 1820.

Return to Berlin and the Writing of *Kosmos* (1827–1859)

Humboldt returned to Berlin in 1827 to take up appointment as chamberlain in the court of the Prussian King. By this time, the personal fortune he had inherited from his mother had been spent in meeting the cost of his travels and scientific research so that a steady income from government employment had become necessary. Two years later, he accepted an invitation from the Czar of Russia for the exploration of Siberia and made many valuable observations on the climate and soils there.

Humboldt set out to consolidate his ideas about science, its nature and purpose, and the fruits of his research in illuminating his concept of universal science. The beginning was made in a series of public lectures in the Royal Academy of Sciences in Berlin during 1827-1828 on the subject that he called "Physical Geography and Man's Effort to Understand the Cosmos". His lectures were so popular that a second series had to be delivered in response to public demand. Humboldt declined the offer of publication of these lectures since he wanted to expand the idea into a book on physical geography. The lectures had contained ideas that subsequently crystalized as his *Kosmos* which, according to one author (Kellner, 1963, p. 199), followed fairly faithfully the lectures which he had delivered in 1828.

Humboldt wrote to his friend Varnhagen (in 1834) that he regarded *Kosmos* as "the work of my life" in which he had planned to put together in one unified work all his scientific ideas and researches of a lifetime—"representing in a single work, the whole material world—all that is known to us of the phenomena of heavenly space and terrestrial life".

Kosmos had been projected as a five-volume work of which the last volume remained incomplete at the time of Humboldt's death in 1859. It was posthumously assembled and published in 1862 from his notes. The first volume contained a general presentation of the whole picture of the universe. The second began by discussing the portrayal of nature by landscape painters and poets through the ages which was followed by the history of man's effort to discover and describe the earth since the earliest times. The third volume was devoted to astronomy and the laws of celestial space; the fourth dealt with the earth; and fifth and final volume was projected to contain a general discussion of plant and animal geography as

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well as a study of man. Unfortunately Humboldt had not been able to cover these topics before he passed away.

Humboldt's Contribution to Geography as a Science

Humboldt was the front-rank contributor to several branches of knowledge including botany, geology, climatology, ecology, physiology and some other related fields. Besides, he was a great master of the empirical method. His scientific voyage to South America and his unmatched collection of data on various aspects of nature was a monument of empirical research. However, unlike most of his contemporaries (who had combined empiricism with a materialistic-atomistic view of science and, therefore had tended to see nature in compartments), Humboldt projected nature as an organic whole born out of harmonious interrelationship between all living and nonliving objects existing together in particular territories. It was this belief that had led him to develop a "universal science" encompassing all aspects of knowledge—moral as well as material—and representing the universe in its totality. The foundation of a universal science was the specific objective of his *Kosmos.* It was the urge to search for unity in science that had attracted him to geography. A distinguished botanist, geologist, ecologist and climatologist in his own right, Humboldt stood out most prominently as the father of modern geography as a discipline devoted to the study of the earth surface (as a whole as well as in parts) and encompassing the whole range of nature (including man) as an organically interrelated and unified entity.

Humboldt's view of geography as a science was projected quite early in his career. In his 1793 book on plant geography, he had clearly stated that "zoology, botany, and geology all form parts of the investigation of nature, but they study only the forms, anatomy, process etc. of individual animals, plants, metallic things or fossils". As against this, plant geography as a part of geography traces the connections and relations by which all plants are bound together, and it designates in what lands they are found. In scope as well as in method, Humboldt's *Geognosia* had provided an important model for modern geography as the discipline concerned with both inorganic as well as organic phenomena on the earth's surface as an interrelated entity. This 1793 statement was reproduced in *Kosmos* as a footnote indicating his continued faith in his original idea of geography. The study of the earth surface or its areal segments was not, however, an end in itself. The objective was to conduct comparative analyses with a view to formulating general concepts to explain interconnection between phenomena occurring together in places, and for the distributional patterns of particular types of phenomena over the earth surface as a whole. According to him, the central problem in the study of the earth surface was to consider "the eternal ties which link the phenomena of life, and those of inanimate nature". To him, the division of knowledge into watertight compartments of the separate systematic sciences presented a major hindrance. He was convinced that "the ties which unite these phenomena, the relations which

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exist between the various forms of organized beings, are discovered only when we have acquired the habit of viewing the globe as a great whole" (*Relation Histoire,* 1814).

One of Humboldt's major contributions as a scientist and theoretician of knowledge was to reconcile the epistemology of Kant and Herder regarding the need for a prior concept of the whole to guide research, with the concept of scientific empiricism of Lavoisier who rejected all traditions and hypotheses, and wanted the data to speak for themselves. In his researches Humboldt crossed the narrow limits of empiricism. In the preface to his *Geognostical Essay* (1823) he wrote:

> In this...essay, as well as in my researches on the *isothermal lines,* on the *geography of plants,* and on the laws which have been observed in the distribution of organic bodies, I have endeavoured, at the same time that I give the detail of phenomena in different zones, to generalize the ideas respecting them, and to connect them with the great questions in natural philosophy... It would degrade the sciences to make their progress depend solely on the accumulation and study of particular phenomena.

Humboldt derived aesthetic satisfaction through the scientific analysis of the ways in which things and phenomena on the earth's surface depended upon each other (Dickinson, 1969, p. 23). This concept of interdependent unity in nature was called *zusammenhang* (hanging together).

The philosophical concept of the earth as an organic whole of interdependent phenomena—a concept that Humboldt shared with Hegel, Goethe and Schiller—rejected the concept of dualism between man and the physical world projected by the materialistic-atomistic view of science which excluded man from the domain of scientific investigation. In line with the natural philosophers and romantic thinkers of his time, Humboldt viewed man as part of nature so that he had to be included in any scientific study of the earth surface. Thus, for Humboldt "The influence exercised upon man by the forces of nature, and the reciprocal, though weaker, action which he in his turn exercises on these natural forces" formed an essential part of scientific study of the earth surface; because

> Dependent, although in a lesser degree than plants and animals, on the soil, and on the material processes of the atmosphere with which he is surrounded—escaping more readily from the control of natural forces, by activity of mind, and the advance of intellectual cultivation, no less than by his wonderful capacity of adapting himself to all climates—man everywhere becomes most essentially associated with terrestrial life (*Kosmos,* vol. I, Otte translation, pp. 360-361).

Humboldt had planned to make the fourth volume of *Kosmos* a two-part work projected to present a complete "physical geography" including the physical and biological laws of the earth surface as well as the study of man, but he passed away before the task was completed so that the place of human geography in his *Kosmos* remained unresolved even though his theoretical perspective on this problem had been put forward clearly in the first volume of *Kosmos.* (Whereas in the nineteenth century English

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usage, physical geography implied a study of the surface features of the earth, Humboldt and other German scholars ascribed a much wider meaning to the term: To them it implied the geography of the whole of the natural world, organic as well as inorganic.)

Since Humboldt firmly believed in the development of science through cumulative wisdom of successive generations, he set his concept of geography in the context of the past developments in geography as a science, beginning with Varenius's *Geographia Generalis* which he referred to as a *physical geography* "in the true sense of the word". But he was prepared to break with tradition in extending his own study to the universe instead of confining the study of the astronomical parts to an introduction. The result was that "throughout the following century this was regarded by many geographers, as a retrogressive step and *Kosmos* was labelled as the last of the great cosmographies rather than a book pointing the way to the future" (Bowen, 1981, p. 148).

Most students of the conceptual history of geography regard Humboldt as the founding father of modern geography—one who was "a pioneer as well as ahead of his times" (Dickinson, 1969, p. 31). French geographer de Mortonne (1948) regarded him as the first geographer to define and apply two essential principles that make geography a "distinctive science" rather than a collection of facts from the physical and biological sciences. The first was the "principle of causality" according to which Humboldt had first observed the complex of spatially arranged phenomena on the earth surface and then proceeded to explain their causal interconnection and interdependence. The second was the "principle of general geography" by which Humboldt sought to compare the location and extent of terrestrial phenomena on the earth surface with a view to unravelling the principles that governed their distribution in the world.

Humboldt's method was empirical and inductive. He collected, classified, and interpreted data pertaining to plants, animals, rocks and other physical aspects with respect to their origins and geographical distribution. The observed patterns of distribution were correlated with the patterns of climate and altitudinal zones over the globe to arrive at a broad generalization with a view to establishing a general theory. Humboldt saw no conflict between the inductive and deductive procedures in science. Thus, in the introductory volume of *Kosmos* he wrote that

> We are still very far from the time when it will be possible to reduce, by operation of thought, all that we perceive by the senses to the unity of rational principle. On the other hand, the exposition of mutually connected facts does not exclude the classification of phenomena according to their rational connections, the generalizing of many specialities in the great mass of observations, or the attempt to discover laws.

Owing to his wide-ranging scientific explorations, and his great contribution to climatology and plant geography, Humboldt is regarded by many as the father of systematic physical geography (in its English connotation). The fact of the matter is, however, that Humboldt was above

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all a *regionalist* in the sense that he had focused on the study of areally arranged phenomena in their interconnections, and in the context of their spatial distribution in relation to climate and other relevant factors, and Humboldt's work on Mexico was, according to Dickinson (1969, p. 28) "a landmark in geographic description" in that, it represented the first of the systematic geographic descriptions, being "in striking contrast to the encyclopaedic compilation of the writers from the days of Strabo to the nineteenth century topographers". For Humboldt there was no dichotomy between systematic and regional studies, and as Hartshorne wrote (1939, p. 82), in what has come to be called "comparative regional geography" Humboldt rather than Ritter was the pioneer.

CARL RITTER (1779–1859) AND HIS CONTRIBUTION TO GEOGRAPHY AS A DISCIPLINE

A friend and contemporary, Ritter is generally regarded along with Humboldt as a cofounder of modern geography. Junior to Humboldt by ten years, he was born in 1779 in a family of modest means. His father, a physician, had died while young Ritter was only five years old. His mother was faced with great difficulty to educate and support her family of five. By a stroke of good fortune, a German educationist, Christian Salzmann, who was starting a new experimental school, was in search of a child who had never been exposed to traditional methods of education, and he chose Ritter as his pupil.

At that time, rote learning was the prevalent system of education—without any attention to understanding and self-experience. Salzmann founded his school on the new principles of Rousseau and Pestalozzi, which emphasized that in the education of the young, clear thinking should be taught through careful observation of phenomena. Young Ritter was put under the charge of J.C.F. Guts-Muths who was specially interested in teaching geography by the new method. As Hartshorne wrote (1939, p. 50), "Probably no student of his time—and few since—have been so specially trained for geography as was Ritter". In Salzmann's school at Schnepfenthal, right from the beginning, Ritter was trained to observe man's relationship to his natural surroundings. His teachers encouraged him to formulate for himself the concept of unity of man and nature; and from the richly varied landscape of this region of hills and low mountains he derived the idea of unity in diversity, which became the basic theme of his writing in later years as he matured into a geographer.

After completing his training in the school, Ritter was employed by a wealthy banker, Bethmann Hollweg, as a private tutor for his two sons, and in return he agreed to meet the expenses of Ritter's university education. With the two Hollweg sons, Ritter went to Frankfurt where he read widely in history and geography. After one of his pupils died, Ritter accompanied the remaining boy to the university of Gottingen where during 1814-1816 he himself took further courses in geography, history, physics, chemistry, botany and minerology.

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Ritter's interest in geography had been greatly aroused after a meeting with Alexander von Humboldt in 1807. He published a two-volume work on the geography of Europe to serve as background reading for a better comprehension of the region's history. Six years later he published the first of the two volumes of his famous *Erdkunde* (1817-1818). Ritter had intended to follow it with a third volume on history, but could not do so. As the book's supplementary title made it clear, Ritter had intended *Erdkunde* to serve as a text on "The Science of the Earth in Relation to Nature and History of Mankind; or General Comparative Geography as the Solid Foundation for the study of, and instruction in, the Physical and the Historical Sciences". The book was very favourably received, and it earned Ritter the post of Professor of Geography at Berlin in 1820. His chief interest in the study of geography was to provide a sound basis for the writing of history. However, his elevation to the first professorship in geography in Germany changed his outlook on the subject as an academic discipline. As professor of geography in Berlin, Ritter devoted himself to a more thorough study of geography. This he started with the rewriting of his *Erdkunde*. A second edition appeared in 1822-1823 and the idea of a third volume on history was dropped. Between 1832 to 1838, he added six more volumes to the *Erdkunde* series; eleven more volumes were to come between 1838 and 1859. These nineteen volumes together covered only the treatment of Africa and Asia when Ritter breathed his last in 1859. However, through these volumes Ritter had succeeded in laying a firm foundation for the writing of a new style regional geography presenting a complete picture of the area under study and incorporating all available information on every aspect through a thorough sifting and synthesis.

Ritter had repeatedly emphasized that he was trying to present a "new scientific geography", as contrasted to the traditional lifeless summary of facts about countries and cities mingled with all sorts of scientific incongruities. His scientific geography was guided by the concept of unity in diversity in nature, and his purpose was not merely to prepare an inventory of phenomena occurring together in particular parts of the earth surface, but to understand the interconnections and the causal interrelations among the diverse phenomena that made the areal associations cohesive. Like Humboldt, Ritter also used the term *zusammenhang* to refer to the harmonious unity and interconnection among diverse phenomena on the earth's surface. In a much-referred essay entitled "Historical Element in Geographical Science" Ritter defined the task of geography to be: "to get away from mere description to the law of the thing described; to reach not a mere enumeration of facts and figures, but the connection of place to place, and the laws which bind together local and general phenomena of the earth's surface". According to Ritter, the geographer's task was to trace causation and interdependence of the spatially distributed phenomena on the earth's surface.

Ritter named his new scientific geography as *Erdkunde* (literally meaning earth science) in preference to Humboldt's *Erdbeschreibung* (meaning

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earth description). A close perusal of Ritter's writings shows that there was never any doubt in his mind about the fact that his geography was concerned primarily with the study of the earth as the home of man, and, as such, was focused on the study of the earth's surface. However, the literal meaning of *Erdkunde* as earth science proved a source of confusion in the minds of many geographers in the following decades who were led to extend the study of geography to include every aspect of the earth.

Ritter's concept of unity in diversity of phenomena on the earth surface was derived from a Kantian view of the world—the world seen as an organic whole rather than as a machine—a view of which Humboldt himself had been a strong supporter. On the concept of organic unity in nature, Ritter wrote: "There is, above all this thought of parts, of features, of phenomena, the conception of the earth as a whole, existing in itself, for itself, an organic thing, advancing by growth, and becoming more... perfect". As Dickinson has noted, Ritter was attracted to view terrestrial units (earth areas) as organic wholes by reading Humboldt's description of the llanos and the steppes. However, as contrasted to Humboldt's idea of organic unity in nature as a rational scientific principle, Ritter's idea of organic unity was derived from his deep faith in the Christian belief that the earth was a divine creation, and that God had created every little thing on the earth surface to serve some need of man. According to him: "As the body is made for the soul, so is the physical globe made for mankind". To sum up, whereas both Humboldt and Ritter had adopted the concept of organic unity in nature as central to their concept of geography, their reasons for doing so differed greatly. In the case of Ritter the justification for doing so was derived from theology; in the case of Humboldt it was a central epistemological issue in his theory of knowledge about the universe.

According to Hartshorne (1939, pp. 60-61) teleology (faith in a divinely created universe) in Ritter's geography was an attempt to interpret philosophically that which could not be explained scientifically. In Ritter's view, there were three fundamental facts of geography for which science had no explanation. These were: Uniqueness of the earth in the universe; the earth as the home of that unique creature, man; and the fundamental explanation of a host of geographic facts—the differentiation in character among the major land units of the world. However, as Schmidt (1925, cited in Hartshorne) wrote, irrespective of his teleology, in his study of geography Ritter did not proceed from preconceived ideas and opinions:

> his scientific procedure was directed throughout on temperate, purely factual comprehension of the facts and their relations... Ritter strove in the knowledge of the earth for a comprehension of the divine world plan in no other way than the natural scientists pursue the thought of evolution.

Ritter insisted that geography must be an empirical science rather than one deduced from rational principles—from philosophy or *a priori* theories such as the theory of continuous mountain ranges and the belief that river basins were divided by crestlines of mountain chains. As Ritter wrote in the first volume of *Erdkunde*: "We must ask the earth itself for its

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laws", i.e., knowledge about the earth should be derived from field observations (even though he himself was—unlike Humboldt—primarily a scholar and a teacher rather than a fieldworker). Observations used in the writing of his books were not obtained directly from the field of his own; they were based on the works of others who had observed the phenomena firsthand.

Ritter was a great pioneer of the regional approach in geography, which he conceptualized as the study of earth areas as organic units deriving their special character from the nature of the interrelationships obtaining between the diverse phenomena existing together. His preference for regional geography—study of areal organization in particular segments of the earth surface—was in no way opposed to the pursuit of general or systematic geography (i.e., topical studies involving analysis of the distributional patterns of a particular class of objects or phenomena over the earth surface with a view to arriving at general theoretical formulations about them). Ritter acknowledged his indebtedness to Humboldt, whose general studies had made Ritter's own regional studies of particular regions possible (James, 1972, p. 168).

Ritter regarded regional and systematic studies in geography as the two sides of the same coin: General geography dealt with the character, typology, location and extent of different categories of terrestrial phenomena (both physical as well as human) throughout the world; special or regional geography described the content and nature of particular areas as organic (i.e., functionally organized) entities. It is true that Ritter's *Erdkunde* was essentially concerned with particular areas, he nevertheless made frequent statements urging the development of a comparative worldwide approach to the study of areas in his teaching and research: "He exposed the conceptual framework of both regional and worldwide geography. He lacked the data in his time to reach worldwide generalizations about areas, though he urged that they should be the geographer's ultimate goal" (Dickinson, 1969, p. 46).

It is, therefore, a disservice to geography, and a false representation of reality, to try to draw differences between the approaches to geography pursued by Humboldt and Ritter. The two men themselves did not recognize any such distinctions. Ritter (according to Hartshorne) repeatedly asserted that Humboldt was his teacher, and wrote that without the work of Humboldt his own books could never have been produced. Ritter acknowledged that "Alexander von Humboldt has become, by his thorough study of nature in Europe, Asia and America, the founder of Comparative Geography" (Ritter's *Comparative Geography*, Gage translation, p. 24).

Trying to clarify his approach to the study of geography, Ritter stated:

> My aim has not been merely to collect and arrange a larger mass of materials than any other predecessor, but to trace the *general laws* which underlie all diversity of nature, to show their connection with every fact taken singly, and to indicate...the perfect unity and harmony which exist in the apparent diversity and caprice which prevail on the globe, and

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> which seem most marked in the mutual relations of nature and man. Out of this course of study there springs the science of physical geography, in which are to be traced all the laws and conditions under whose influence the great diversity in things... first springs into existence, and undergoes subsequent modifications (from a letter cited in Gage, *Life of Ritter*, 1867).

Since Ritter's *Erdkunde* was designed to provide a basis for tracing the general laws of physical geography, for him there could be no question of any conflict between the regional and systematic perspectives in, and approaches to, geographical studies. In Ritter's (teleological) concept of unity and harmony in nature,

> A supreme Being, an all-wise Creator, was identified as the author of the plan for building the earth as the home of man, and all through Ritter's writings and lectures, are words of praise for the divine creation. Even in the arrangement of continents Ritter saw evidence of God's purpose. (James, 1972, pp. 168-169).

According to Ritter, Asia represented the sunrise, since it is here that the early civilizations of man originated. Africa was viewed as representing the noon where, owing to smoothness of relief and *uniformity* of climate, the inhabitants are induced to slumber. Europe was viewed as specially designed to bring out man's greatest accomplishments—the culmination of man's development—so that it represented the sunset, the end of the day. The discovery of America suggested to him the approach of a new sunset and a new culmination of human achievement. Owing to his teleological belief, Ritter's consideration of the earth was principally man oriented. This did not, in any way, lead him to oppose other ways of looking at the phenomena of the earth surface. He wrote: "Independent of man, earth is also without him, the scene of natural phenomena; the law of its formation cannot proceed from man. In a science of the earth, the earth itself must be asked for its laws" (cited in Hartshorne, 1939, p. 63). This statement makes it clear that any attempt to involve Ritter in the controversy regarding dualism between human *vs* physical geography is doing violence to his personal stance in this regard. Ritter's concept of teleology was not antiscientific.

LEGACY OF HUMBOLDT AND RITTER

Irrespective of the fact that both Humboldt and Ritter had viewed geography as a unified science, part regional and part systematic, and equally focused on the study of man as well as the physical environment that surrounds him; the generation of geographers that followed them in Germany and elsewhere had started to view them as representing somewhat parallel (and conflicting) streams in geography. Regional geography focused on spatial patterns of human activities in particular parts of the earth surface and systematic geography focused on the analysis of the nature of spatial variation in the patterns of distribution of diverse phenomena over the earth surface with a view to identifying the factors that have created these patterns. Since most of the phenomena studied under this perspective had

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belonged to the physical elements of the earth's environment, systematic geography became identified as physical geography (that is, as the study of physical phenomena as distinguished from man and his activities studied in regional geography). This was the source of the false notion that Humboldt and Ritter were opposed in their views on the nature, content, and methodology of geographical work, and that whereas Humboldt was the father of modern geography as a systematic science concerned with topical studies of the physical aspects of the earth surface, Ritter founded regional geography focused on the study of segments of the earth surface as the home of particular human groups. The truth is that even though their style of work had differed, their geographical perspectives (and their works) were complementary rather than conflicting, so that the two together laid a clear foundation for modern geography as a discipline that studies both man as well as his physical environment; and is equally interested in the study of areal association of phenomena in particular segments of the earth surface as well as detailed analysis of global patterns of distribution of particular aspects of the physical environment.

As James has noted, Humboldt and Ritter had left quite different legacies for the future generations of geographers. Humboldt sought answers to a great variety of specific questions. To cite examples: He tried to develop a general theory regarding the distribution of average temperatures on the earth's surface in relation to the distribution of continents and oceans; and in the course of his South American voyage he attempted to define how changes in altitude influence the life of plants, animals, and man in a tropical environment. However, though he was one of the most versatile scholars of his time, Humboldt founded no school and left no disciples so that the method of asking questions and seeking answers that he had so effectively demonstrated in his own research, was not "rediscovered" by geographers until several decades after his death. As contrasted to this, a school of followers did develop around Ritter: Through his position as the holder of the only chair in geography in Germany, Ritter left behind a band of disciples who enthusiastically applied themselves to the furtherance of the regional perspective in geography; and some of them undertook to complete his plan of *Erdkunde* for the remaining parts of the world which Ritter had not been able to cover before his death in 1859. This would partly explain why, despite Humboldt's far greater stature as a scientist, and his having laid a sound foundation for geography as a field of scientific enquiry, most geographers pursued geography primarily as regional description. The fact remains, however, that the two together "provided an almost complete and modern programme for geography" (Tatham, 1951, p. 28).

SOME EMINENT FOLLOWERS

Elisee Reclus (1830–1905)

Reclus had studied under Ritter in Berlin during 1849-1850. This association

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had created in him a deep love for geography. Not only did he follow Ritter's concept and method of geography, he also made considerable improvement upon them. Reclus had been expelled from his native France in 1851 on the charge of holding anarchist views. First he went to England, then to the United States and South America, and continued travelling and working until he was permitted to return to France in 1856. The period of exile was utilized by him to write a two-volume work on geography under the title *La Terre,* though the book could be published only in 1868-1869. *La Terre,* written so soon after his studies under Ritter, strongly mirrored the ideas and concepts of the master, some of which Reclus later abandoned.

Reclus was exiled a second time in 1871 for holding revolutionary views. This time Reclus went to Switzerland where he devoted himself to writing a nineteen-volume work under the title: *Nouvelle Geographie Universelle.* The volumes were written in the period of his exile and stay in different countries, including Switzerland, Belgium, and the UK. Reclus's new universal geography has been described as "the last echo of the classical period when one scholar could present all available knowledge about the earth as the home of man.... Unlike Ritter's *Erdkunde,* which is well known for its numerous obscure passages, Reclus's work was easy to read and understand" (James, 1972, p. 192). The book was translated into English under the title: *Earth and Its Inhabitants* and published in New York between 1882–1895. It contained about 3,000 maps. In it Reclus achieved single-handed what Ritter himself had failed to do, that is, to provide a complete description of the earth's surface on a regional basis.

Reclus was one of those of Ritter's students who had steered clear of the master's teleological beliefs. Reclus's philosophical approach to man-environment relationships was far more enlightened. On the one hand, he granted the role of nature as a dominant force in shaping human history, so that according to him "We have even a right to assert that history of the development of mankind was written beforehand in sublime lettering on the plains, valleys and coasts of our continents", but he counter-balanced such statements by conceding that "Man may modify (his dwelling place) to suit his own purpose; he may overcome nature, as it were, and convert the energies of the earth into domesticated forces". According to Reclus, the student of landscapes must seek to trace "gradual changes in the historical importance of configuration of the land", and that in the study of the geography of places it was necessary to "take account of another element of equal value—time". This statement underlined a possibilistic view of man's role in changing the face of the earth.

Arnold Guyot (1807–1884)

Guyot was a Swiss by birth. He had studied geography under Ritter, and remained a faithful follower of his teacher's concept and philosophy. Guyot came to the United States in 1848 to deliver a series of lectures on the "new geography" in Germany. The lectures were published as a book the following year, and became the instrument for spreading Ritter's ideas in the New

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World. Guyot was critical of the traditional descriptive geography then being taught in American schools, which required the student to memorize a large number of unrelated facts. Guyot asserted that "new geography" should not only describe, it should also compare and interpret: It should be concerned with "the how and wherefore of the phenomena it describes". Guyot's influence in American geography greatly increased after the Massachusetts Board of Education invited him to deliver a series of lectures on the nature and methods of teaching new geography. His influence spread rapidly to other parts of America, and for decades his textbooks set the standard for elementary and secondary classes in American schools.

Guyot was appointed professor of geography and geology at the College of New Jersey (Princeton) in 1854, and stayed there until his retirement in 1880. Unlike Reclus, Guyot was a strong supporter of Ritter's teleological ideas so that

> Even as the widespread acceptance of the concepts of evolution as developed by Darwin, Wallace, and Huxley swept away the philosophical ideas of the theologists, Guyot's stand remained unshaken. When he retired in 1880 the "new geography" he preached was not only old but its philosophical basis had been largely discredited. (James, 1972, p. 193).

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3

Geography after Humboldt and Ritter: Developments in Germany

THE INTELLECTUAL CLIMATE OF THE TIME

The deaths of Humboldt and Ritter in 1859 marked the end of an era in the development of geography as a branch of scientific knowledge. Humboldt and Ritter had stood at the crossroads between the classical and the modern. In that sense they had jointly represented both a beginning and an end. The scheme of classification of knowledge presented by Kant (though not necessarily originated by him), had by now become commonly accepted so that geography had come to occupy a definite place among the sciences as a branch of knowledge which brings to bear a spatial perspective to the study of diverse phenomena on the earth's surface. The rapid explosion of knowledge following many a voyage of scientific discovery to far-off areas of the earth surface, and the analysis of the massive data collected therefrom, gave rise to a series of systematic sciences, each defined in terms of the kind of phenomena it studied. This represented Kant's logical division of knowledge, as contrasted to his scheme of physical division in terms of the arrangement of phenomena of diverse origin in time (history) or space (geography). The dual scheme of division of knowledge into a series of systematic sciences each devoted to a distinct subject matter, and its classification in terms of the association of diverse phenomena vertically in terms of time periods of history, or horizontally in terms of geographical space, implied a final fracturing of the classical view about the unity of knowledge. Humboldt was the last great figure who could claim universal scholarship.

The scientific voyages of discovery in the eighteenth and early nineteenth century had completely revolutionized the biological sciences. Diverse theories about the nature and origins of plants and animals in various parts of the earth's surface had begun to be pieced together to produce overarching theories, culminating in Charles Darwin's *The Origin of Species* whose publication in 1859 (coinciding with the death of Humboldt and Ritter) had contributed to a major change in perspective in every field of science—natural and physical, human as well as material.

Darwin's *The Origin of Species* established that organisms on the earth's surface have evolved through a slow and cumulative process of change;

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and that the evolutionary process of change among different organisms had not resulted from need or use (as postulated by Lamarck). Referring to Lamarck's famous example of the giraffe, Darwin noted that the giraffe did not get his long neck by stretching for fodder. The fact was that the individual giraffes that were born with longer necks were better equipped to survive in the Savanna environment than were the short-necked ones, and so this feature was slowly passed on to later generations. In his explanation of the mechanism of the evolution of species Darwin demonstrated that this was far from a straight line process, and randomness and chance had played a major role in evolution. Confirmation of the role of randomness and chance in the evolution of life forms cut at the very base of the long and widely subscribed view that the universe was a divine creation. Teleology could no longer be sustained as a scientific hypothesis, and was quickly abandoned. An equally important and radical concept was the idea of cumulative change through time. These ideas which appear as simple knowledge today, were highly revolutionary at the time they were presented, and were influential in changing the thought processes of contemporary science (Livingstone, 1992, pp. 178–189).

An aspect of the evolutionary theory, of particular importance to geography, was that it emphasized the need to study phenomena on the earth's surface in relation to the environment in which they were located, since only in this way could their struggle for survival and environmental adjustment be adequately appreciated. This gave a further justification for the methodology and perspective of geography as a science.

The concept of evolution, which attracted many scholars in branches of knowledge outside of biology, appeared in the study of landforms as Davis's cycle of erosion and was also reflected in the concept of mature soils developed through a slow process of change from parent materials. Applied to the study of human groups, it became the theory of social Darwinism of which Freidrich Ratzel was the staunchest supporter in geography.

THE CRISIS OF IDENTITY IN GEOGRAPHY

A major aspect of the changed perspective in science in the eighteenth century was the rise of systematic sciences. This meant that the subject matter that had previously been identified as general geography now became divided into the domains of a series of natural and physical sciences, as a result of which geography was faced with a real crisis of identity. Humboldt had tried to resolve this crisis by emphasizing that after the newly emerging systematic sciences had divided up the original content of general geography, there was still a field of study that had not been appropriated by any of them. This related to the study of interconnections among phenomena of diverse origins existing together in harmonious relationship in particular segments of the earth's surface. These interconnections give personality to particular areas and regions, and only through reference to such

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interconnections could the nature and spatial distribution of diverse earth phenomena e.g., plants and animals, and elements of climate etc. be properly understood and explained.

The most characteristic feature of the many systematic fields of sciences that had emerged in the eighteenth and early part of the nineteenth century was the method of study adopted by them. Their approach to study consisted of first isolating the processes or the phenomena that each of them examined, and then proceeding to formulate an ideal (abstract) model of how each process works in isolation. In other words, progress in the systematic natural and physical sciences was achieved by specifically excluding the effect of the real life situation wherein phenomena of diverse origin and therefore belonging to the domains of separate sciences, exist together in symbiotic relationship. Viewed this way, the methods and objectives of the systematic sciences appeared to be at cross-purposes with the holistic perspective of geography. Since geography could not identify any particular circle of facts as its special object of study, it began to lose its claim as a science irrespective of the unquestioned personal stature of Humboldt as the leading scientist of his time.

As the study of physical aspects of the earth was parcelled into the domains of a series of independent sciences, each seeking to isolate processes pertaining to the particular category that formed its special field of enquiry, the concept of "natural units" (Lander) comprising physical environment and man in particular segments of the earth surface as envisaged by Forster and further refined by Humboldt and Ritter, lost respectability as a field of scientific interest. Geography, therefore, began to be slowly neglected as a scientific pursuit, so that Ritter's chair in geography at Berlin remained vacant for a long time.

Geography experienced revival as an academic discipline only after the unification of Germany under the leadership of Prussia in 1871 following realization by the leaders of the government of the need to promote geographical knowledge about lands and people around the globe with a view to serving the interests of colonial expansion in the increasingly competitive world of imperialism.

Under the circumstances, geography was faced with three major tasks: Continued collection of information about the relatively little-known parts of the earth and its presentation in a useful form; detailed study of particular places in order to facilitate the work of officers of government, and serve the needs of businessmen and military commanders; and formulation of concepts about spatial association and variation of phenomena on the earth's surface through empirical generalizations.

Another significant and noteworthy aspect of the empirical-theoretical model of scientific research, promoted in the course of the rise of new systematic branches of science, was the insistence that the study of human and non-human phenomena required very different methods of study, and as such no field of scientific research could include both. In the intellectual climate of the times doing so was against the logic of science. The net result

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for geography was that after the deaths of Humboldt and Ritter in 1859, geography rapidly lost respectability as a branch of science. This led to a temporary parting of the ways between physical and human-regional geography; since the former could be pursued through the analytical method of natural and physical sciences, whereas the latter was descriptive and holistic in perspective. Serious attempts at reconciling this dualism between physical and human, and regional and systematic geography were made only in the 1880s.

DEVELOPMENTS IN GERMANY

For reasons indicated in the preceding paragraphs, after the death of Ritter, geography in Germany lost unified focus as a scientific discipline. Questions regarding its nature and methodology were seldom asked because they were difficult to answer. However, practical utility of geography to the army commanders in regard to the scene of military operations, to the government administrators in the newly acquired German colonial possessions, and to businessmen for purposes of trade and commerce was clearly recognized. For each of these purposes, clearly designed maps incorporating the latest available information were an urgent need. Accordingly, regional description and cartography became identified as the primary task of geography at that time. For the time being geography became "anything that could be put on maps". At the higher levels, as a field of teaching and research geography remained chiefly concerned with providing background information about the land and people in particular places with a view to facilitating a better comprehension of their history. All this began to change, however, after 1871 when the Prussian government (conscious of the utility of geography as an aid to colonial administration and territorial expansion) created a number of new professorships in geography in several universities across the country as a result of which geography regained respectability as a field of learning. A brief discussion of the ideas and works of some of the leaders of German geography in the last quarter of nineteenth century follows.

RISE OF DUALISM BETWEEN PHYSICAL AND HUMAN GEOGRAPHY

Oscar Peschel (1826–1875)

For about twenty years before his death in 1875, Oscar Peschel had been the leading academic geographer in Germany. He raised some fundamental questions concerning the nature of geography, and was critical of the approaches of both Humboldt and Ritter. Peschel is described by some as the last great geographer before the discipline was finally overtaken by the impact of Darwinian ideas. Although most of Peschel's own works had appeared in print after the publication of Darwin's *The Origin of Species*, the implication of Darwinian ideas in the interpretation of earthbound phenomena and human societies had not yet been fully realized.

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Peschel had started his career as a journalist in 1849, and was the editor of *Ausland* from 1854 to 1870 when he was pursuaded to take up appointment as professor of geography at the university of Leipzig in 1871. During his editorship of *Ausland*, he had regularly published articles on lands and peoples of the world with a view to promoting geographical knowledge among the reading public. He himself wrote extensively on the history of ancient geography, and on the basis of this expertise he was invited by the historical commission of the Royal Academy of Sciences to write a book on the history of geography as part of a series on the history of science in Germany. This book was published under the title *Geschishte der Erdkunde* in 1865. It was this book that attracted attention to him as an academic geographer. From 1866 onward he published a number of methodological articles in which he took issue with Humboldt and Ritter. These methodological papers were collected and published as a book in 1870 under the title *Neue Probleme der Vergleichenden Erdkunde.* As the Belgian geographer Michotte wrote: "It has been justly said that with this work the scientific spirit reentered geography" (cited in Hartshorne, 1939, p. 88).

Peschel was very critical of Ritter's method of comparative geography (*vergleichenden erdkunde*), especially his practice of comparing entire continents or large segments of them. Peschel noted that since continents and large areal units contained great deal of internal diversity (one quite different from the other) they could not be compared in the proper scientific sense. Comparison was possible only in respect of clearly identifiable features or characteristics, such as particular types of landforms, climatic types, or distribution of plant cover. He demonstrated it with reference to his own study of fjord coasts. His study had revealed that this type of coastal topography is characteristic of the western margins of the continents in the higher latitudes. On the basis of this comparative study, he was able to explain the origins of fjord topography to be the result of abandoned valleys of former glaciers. Peschel insisted that comparative geography should have a definite method and purpose: The geographer pursuing comparative study should seek (with the help of large-scale maps) similar physical features in different parts of the earth's surface, compare their characteristics and origins, and try to relate them all genetically (following the method of comparative anatomy). Peschel thus laid a sound basis for comparative research in geography. His method required the student to begin by studying topographic maps with a view to identifying "homologies" (i.e., landforms of similar types), and then try to trace their origins in each of the areas where they occur. Owing to limitations of data and knowledge about the work of agents of erosion, and the nature of regional geology, studies pursued by this method had not always been successful; but that was no fault of Peschel's methodology.

Peschel (1879) attempted to establish physical geography as a science. He was critical of Ritter for having neglected physical geography, and he criticized Humboldt for not having attempted a scientific classification of landforms. He was also critical of Humboldt for creating the impression that general geography could be equated with the entirety of natural science.

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Ritter was further decried for holding a teleological view about the nature and origins of earth phenomena, and for having subordinated geography to history by presenting his own works essentially to serve as a tool for better understanding of history. Peschel believed that physical and human geography constituted two entirely separate domains of knowledge, and as such the two could not form part of a single science. He was, thus, the originator of dualism between physical and human geography, and was strongly of the view that geography should be pursued primarily as a study of the physical phenomena of the earth. His methodological view regarding the distinction between physical and human in the study of geography notwithstanding, Peschel himself made an in-depth study of the geographical distribution of the races and cultures of mankind. It is indeed ironical that his book entitled *The Races of Mankind: Their Geographical Distribution* (1876) is the only work of Peschel available in English translation today (Dickinson, 1969, pp. 56–58).

George Gerland (1833–1919)

Peschel's exhortation that in order to project its status as a science, geography should identify itself more and more as physical geography, was further advanced by another contemporary named George Gerland. Gerland was professor of geography at the university of Strasbourg, and had been the supervisor of the doctoral thesis of Alfred Hettner. In a long essay published in 1887 Gerland had gone so far as to suggest that since man could not be put to scientific analysis, study of man should be taken outside the purview of geography. Thus, according to Hartshorne (1939, p. 97):

> In the latter half of the nineteenth century, under the influence of specialized sciences, geography for a time appeared to be changing into a field quite different in character from that which Humboldt and Ritter had inherited and developed. The emphasis on systematic studies appeared to divide geography into two halves, one a natural science, the other a social science, united only in a study of regions that hardly appeared to be science at all.

Thus, the continuance of geography as a unified field of academic inquiry incorporating the study of human as well as physical elements of the earth's surface was in serious crisis.

In the last two decades of the nineteenth century, several attempts were made to resolve this dualism, and to project geography as an integrated science concerned with the study of phenomena on the earth's surface—both physical as well as human—in terms of their spatial distributions and areal associations. The most successful of such attempts were those put forward by Ratzel, and Alexander von Richthofen. Although Richthofen was the elder of the two, the first volume of Ratzel's methodologically epoch-making work *Anthropogeographie* (1882) was published a year earlier than Richthofen's epoch-making methodological statement presented in his 1883 inaugural address for the chair in geography at Leipzig. We discuss the two in that order.

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RE-ESTABLISHMENT OF GEOGRAPHY AS AN INTEGRATED SCIENCE: THE STUDY OF MAN-LAND RELATIONSHIPS

Friedrich Ratzel (1844–1904)

Described as the greatest single contributor to the development of geography of man, Friedrich Ratzel was born in a middle class German family in 1844. He pursued advanced study in zoology, first at Heidelberg and then at Jena. Ratzel's youth had passed through a period of great intellectual upheaval in the world of science in the wake of the publication of Darwin's concept about the origins of species. Ratzel had written a dissertation on Darwin's theory in 1869. He was, however, more interested in field studies of plants and animals than in the laboratory. He took employment as an assistant to a French naturalist on his trip to countries around the Mediterranean, but as war broke out between France and Prussia in 1870, Ratzel quit the job to join the Prussian army. After the war, he went to Munich to register as a student. There he came in touch with the famous naturalist and ethnographer Moritz Wagner and was introduced to his theory about the importance of migration in the evolution of species.

Ratzel was greatly excited by travel. As part of this interest, he was drawn to studying how the people of German extraction lived and made use of resources in different parts of the world. His project for such a work was accepted by the editor of *Kolinsche Zeitung,* and he was employed as a roving reporter. This enabled him to travel to several countries in Eastern Europe inhabited by sizeable numbers of German minorities. He visited Italy in 1872, and U.S.A. and Mexico in 1874-1875. His visit to the New World has been described as the turning point in his career. From his study of various minority groups—European, American, and Chinese—he devoted himself to developing general concepts regarding geographical patterns resulting from contacts between aggressively expanding communities and the retreating indigenous populations. It was such research experience in regional study that aroused his interest in the study of human geography.

Ratzel's extensive travels in the New World resulted in several publications. One on Chinese migration appeared in 1876; two volumes on the United States were published in 1878 and 1880 dealing with the country's physical and cultural geography with special emphasis on its economic scene. These books brought to their author considerable popularity and honour as a scholar. After his return from the New World in 1875, Ratzel resigned his job as a journalist and took up assignment as a tutor (*privat dozent*) in geography at the institute of technology in Munich. He was made professor of geography in 1880. Ratzel left Munich in 1886 to join the university of Leipzig as professor of geography. He stayed there until his death in 1904.

After completing the publication of the results of his travels to the United States, Ratzel turned his attention to methodological issues. The first fruit of his labour came in the form of the first volume of *Anthropogeographie* in 1882. The appearance of this book marked a major event in

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the history of geography in that it had a direct and far-reaching effect on the nature and methodology of geography which at that time was faced with a serious crisis of identity with regard to both its content and practice. According to Hartshorne (1939, p. 90) the term *anthropogeographie* was in itself misleading in that it suggested the connotation of geography of man in terms of individuals and races (that is, anthropological geography) whereas the major thrust of the work concerned the works of man, particularly the products of man's social life and relationship to the earth. (This was clearly a reflection of the influence of the ethnographer Moritz Wagner whom he had met in Munich.) With his sound background in the life sciences, Ratzel saw in geography the sought-for opportunity for establishing a connection between natural sciences and the study of man.

Ratzel set out to lay a scientific foundation for the study of man in geography. In his *Anthropogeographie* he demonstrated that the geography of man and his work could as well be put to systematic analysis as the elements of the non-human (i.e., physical) world. Ratzel was, therefore, in the true sense of the term, the father of modern human geography as a field of scientific enquiry.

The second volume of Ratzel's *Anthropogeographie* was published in 1891. The two volumes had represented two different approaches to the study of the human element in geography. The first volume was organized in terms of physical features of the earth, which were studied in terms of their influence on human culture. The central focus of this volume was to analyze how far and in what manner man's life upon the earth is shaped by the physical forces of nature. This was the common procedure adopted by geographers at that time, though some of Ratzel's contemporaries (most notably Kirchhoff, 1833–1907) had started studying human geography by the reverse method; that is, by analysing human activities and human cultures in relation to the physical environment which, in methodological terms, implied proceeding in the study of human geography by starting with man rather than the natural environment. The second volume of Ratzel's *Anthropogeographie* was written from this reverse perspective. Strangely, however, in the English-speaking world, it was Ratzel's first volume rather than the second that became the dominant input in human geographical methodology so that he came to be identified by later generations of geographers with the concept of human geography as the study of the works of man in terms of influences of the physical environment. This was the source of the long and erroneously held belief that Ratzel had advocated a deterministic view of human geography.

The first volume of *Anthropogeographie* had carried the rather revealing subtitle "An introduction to the application of geography to history". Thus, the book was designed to seek the causes of human phenomena in the natural environment. Clearly enough, Ratzel's approach was influenced by the theory that the physical environment played an active role in the evolution of life forms on the earth's surface. This was one of the basic ideas of the Darwinian theory of evolution. It had great attraction for

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geographers in view of the discipline's long-standing concern with the study of the interconnection between man and his environment. Under the impact of this revived perspective of evolutionary biology, man began to be viewed somewhat like an organism that could be studied in the way that biologists studied the organisms in nature in relation to their physical environment. This was the beginning of the social Darwinist concept in human geography. The idea that the Darwinian theory could by analogy be used as a methodological device in the study of human societies had been earlier suggested by the English philosopher Herbert Spencer (1820–1903), who drew attention to the close resemblance of human societies to natural organisms, and speculated that some of the principles of evolutionary biology could be fruitfully applied to the study of man. This basic idea became the central theme in Ratzel's *Politische Geographie* (1897) wherein he described the state as an organism attached to the land, which like other organisms in nature passes through a developmental cycle: Like natural organisms, the states also must grow or die since they cannot stand still. Like other natural organisms, states were conceptualized to be involved in an ongoing struggle for survival. This struggle was manifested in the states' exertions to acquire larger and larger territories as living spaces to support their growing populations. This was the central idea behind the concept of *Lebensraum* (living space), that became so popular in Germany during the interwar years. The concept implied the right of the more powerful states to expand their territories at the expense of their weaker neighbours.

The second volume of Ratzel's *Anthropogeographie* (1891) had carried the subtitle "The Geographical Distribution of Mankind". This indicated a reversal of approach to the study of human geography from the one adopted in his first volume published nine years earlier. Now the focus had shifted from the physical environment to human groups. In attempting to explain geographical distribution of cultural phenomena, Ratzel now paid greater attention to the role of migrations in the diffusion of cultural traits. He believed that every migration had an area of origin, and a specific cause and that each followed a particular route to its given destination. The migrant societies carried their memories, traditions, and skills with them and the pattern of life adopted in the new area of inhabitance resulted from two sets of forces--one from the local geographical environment, and the other from their remembered culture and technology which motivated them to use the environment in their own special way. Thus, for a full geographical explanation of cultural features it was necessary that the geographer should consider both geographical and historical factors.

Ratzel was the first geographer to clearly formulate the concept of cultural landscape, which he often referred to as historical landscape since it is in reality a palimpsest of the preceding historical phases of human occupancy in any area. He recognized ethnographic groups as geographic assemblages of interrelated phenomena, and sought to explain them not so much as *in situ* developments of similar phenomena in different parts of the earth, but as the result of spread and splintering of ideas and phenomena

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by migrations through the march of history (Dickinson, 1969, p. 71). The idea of cultural landscape and the related technique of human geographic analysis were admirably used in Ratzel's 1898 book on *Deutschland* which is generally regarded as a classic study of its type, and which had for a long time served as a standard text in the German schools. The sixth edition (revised by Hans Bobek) appeared in 1943.

To sum up, Ratzel's concept of human geography consisted of two different approaches to the study of man and his activities upon the earth's surface: One involved the measurement of the consistent interrelationships of the environment and man; and the other focused on the measurement of interrelationships between areally coincident human geographic phenomena in particular places over the surface of the earth. The former focused on the role of the physical environment in the shaping of human activities, and the latter on coincidence, correlations, and interrelations of distributions of phenomena over the earth's surface. These were to be interpreted in terms of the physical and cultural elements of the particular places and regions. The theoretical basis of the first approach was that a particular set of physical environment shall always be associated with a specific pattern of human response, since the physical environment exercised a controlling influence on human activities. This doctrine found its clearest expression in W.M. Davis's concept of geography presented in his 1903 paper entitled: "A Scheme of Geography", published in the *Geographical Journal*. Underlining the distinction between the concepts of Ratzel and Davis, Dickinson has rightly noted that whereas Davis's concept projected geography as the study of man-land relationships from a deterministic perspective, Ratzel viewed geography as the study of covariants of human distributions over the earth's surface. The reason for this difference in perspectives may lie partly in that Davis was trained as a geologist while Ratzel had been an advanced student of the life sciences and as such had a better appreciation of the Darwinian ideas and their limitations. Thus in the study of man's relationship to his environment Ratzel gave due recognition of historical factors which play a major role in deciding how a community shall use its environment. Thus, as a contemporary French geographer, Louis Raveneau, was reported to have stated, Ratzel's "principal merit is that he reintegrated into geography the human element" (which Peschel and Gerland had tried to banish) without in any way lessening the importance of the physical elements. As he put it, Ratzel had taken a stand "between physical geography, sometimes predominant or exclusive, and the science of man which neglects so easily the framework in which man moves and the space in which he lives". By means of this middle course Ratzel had presented a model for geographical study that helped to eliminate the supposed dualism between physical and human geography, and thereby he contributed to reestablish geography as an integrated discipline equally concerned with the study of man as well as the physical environment.

Ratzel also distinguished himself as a leading scholar of ethnography. While still at Munich he wrote a three-volume work of *Volkerkunde* (published

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between 1885 and 1888) which was later translated into English under the title *The History of Mankind* (1896-1898). Anthropologists Lowie and Penniman (1935) described Ratzel's contribution to ethnography as one of outstanding value. (See: Livingstone, 1992, "The Ratzelian Programme", pp. 196-202.)

INTEGRATION THROUGH THE CONCEPT OF CHOROLOGY

Ferdinand von Richthofen (1833–1905)

Richthofen was born in an aristocratic family of Kalsruhe in Silesia in 1833. He had received advanced training in geology, and was keenly interested in pursuing a career in geological exploration and research. To begin with, he started research in the Alps and later, under the auspices of the Austrian government, in the Carpathians. In 1860, he was selected by the Prussian government to accompany an expedition to the Far-east to study the region's lands and resources. After working in China for some time, Richthofen went to California where he spent six years devoting himself to the study of geology in the field as well as in the laboratory. While in California, he received an offer from the Bank of California to support his fieldwork in China on condition that he should regularly report the results of his explorations to the Chamber of Commerce at Shanghai. In the course of his field observations in China, Richthofen was the first to map the coal fields of China.

Richthofen's interest in the field was not limited to locating minerals. He was keenly interested in the study of geological structures and the origins of landforms. He was the first to identify the extensive stretch of land to the east of the Gobi desert covered with a thick layer of powdery material as being wind-blown dust or *loess*. He had also noted that these extensive plains of loess as well as other sedimentary rocks lay over a relatively level to gently rolling surface that cut across old geological structures of varying degrees of resistance to erosion. This led him to advance the theory that the underlying platform had been carved by oceanic waves striking against a continuously sinking landmass.

Richthofen returned to Germany in 1872 with the intention of consolidating the results of his explorations in China. The new German empire had been just inaugurated, and it was keen on promoting scientific research through liberal financial grants. Richthofen received a suitable grant for the publication of his China studies, and five volumes of it were published between 1877 to 1912.

Berlin, which was home for Richthofen after his return from China, had given him enthusiastic reception. He was put in charge of the *Gesellschaft fur Erdkunde* which under his leadership emerged as the first-rank geographical society. He was appointed to the post of professor of geography at the University of Berlin in 1875 where he was granted leave of absence to complete his China work. In 1877 he accepted appointment to the chair of geography at the university of Bonn. From then on, formal academic

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work began to occupy most of his time so that his China volumes were put aside for some time. In 1883 Richthofen moved from Bonn to Leipzig. He returned to Berlin in 1886 to accept a new chair in physical geography.

In geography, Richthofen is best known for his epoch-making inaugural address delivered at the time of accepting the chair of geography at Leipzig in 1883. In this address, he took over the Humboldt-and-Ritter idea of geography as science that is distinguished by its chorological or spatial-distributional perspective. In his 1883 address, Richthofen showed himself to be "the actual one to inherit and carry forward the ideas of Humboldt and Ritter.... He had the sound, unprejudiced historical sense to fit himself into the course of development and to determine his position exactly" (Plewe, cited in Hartshorne, 1939). As Hartshorne has noted, if Richthofen's address is read against the background of the methodological views of Humboldt and Ritter, one is struck by the fact that Richthofen was primarily interested in seeking common ground in the ideas of his two great German predecessors at a time when most others were busy establishing points of contrast between their views. However, given the fact that he was himself trained as a geologist, Richthofen was in greater sympathy with Humboldt than Ritter, and like Humboldt, he endeavoured to restore the close connection of geography with the natural sciences.

Richthofen's answer to the question: What is geography?, was soon to be acclaimed as the pioneer statement on the scope and method of modern geography—one that, in the words of Hartshorne "set the direction of geographic thought for the future". According to Richthofen, it was the distinctive purpose of geography to focus attention on the diverse phenomena that occur in interrelation on the face of the earth. He emphasized that in order to reach useful and reliable conclusions, geographical study of any part of the earth surface must start with a careful description of its physical features, and from there the student should move on to examine the interrelationships of other features of the earth's surface to the physical geographic framework described at the outset. He underlined that the highest goal of geography was the exploration of the relationship of man to the physical earth and to the biotic features associated with it. This was later adopted as standard procedure in the study of regional geography.

Another major theme in Richthofen's methodological discourse was to seek answers to the twin questions: Is geography as a science to be restricted to descriptive accounts of parts of the earth surface, or is it also concerned with generalizations and theory? And: What is the nature of the relationship between general geography and regional geography? Richthofen answered the two questions together as an interrelated set. He asserted that in order to arrive at general concepts, one has first to make observations in particular areas where the features appear as unique. Such observations constitute regional or special geography. Regional geography has of necessity to be descriptive; but description cannot be the end purpose of any study. The geographer must go beyond mere description of unique features in particular areas to seek regularities of occurrence, and to formulate

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hypotheses that explain the observed characteristics. Loess, for example, can be observed, measured, and carefully described; but a regional study of the loess region must also look for the process by which loess is accumulated and the manner in which the presence of loess influences the cover of plants and man's use of the region. In pursuing this method of study, Richthofen was clearly following the lead given by Humboldt.

To sum up, under the leadership of Richthofen, geography came to be defined as the science of the earth's surface (and of things and phenomena causally interrelated with it) pursued by the method of observation in the field. Geography was to be pursued by two different approaches depending upon whether *areas* or *things and phenomena* were the primary objective of study. In the study of areas (regional geography), the approach was predominantly synthetic and descriptive. In the case of study of phenomena or things distributed over the earth's surface in causal interrelationship with physical elements of the earth environment, the method of approach was the comparative study of larger areas with a view to identifying the nature of causal interrelationship in each area, so that inductive reasoning may lead to general ideas and theories. This was the method of study to be adopted in general geography wherein the emphasis was on analysis rather than synthesis.

As Hartshorne wrote, Richthofen's exposition of the relation of systematic (i.e., general) geography and regional geography with each other, and to the field of geography as a whole, was of immense importance in the development of geographic thought. The real purpose of systematic geography, according to Richthofen, was to lead to an understanding of the causal relations of phenomena in areas—an understanding which can be expressed in the form of principles that can be applied in the interpretation of individual regions, called *chorology* or regional geography. Richthofen distinguished between a first step chorology, which is non-explanatory description, providing material for systematic geography; and chorology, as a final step, in which the explanatory study of regions is based on systematic geography. Thus, as Hartshorne (1939, pp. 92-93) wrote: "Not bound by any limited concept of science, Richthofen, like Humboldt, saw no objection to a single science considering different kinds of things that exist together and are bound together by causal connections". To him geography involved no duality between physical and human; it studied both insofar as they illuminated an understanding of the earth surface as the home of man.

Alfred Hettner (1859–1941)

The revived concept of geography as chorology found a very effective advocate in Alfred Hettner under whose leadership chorology became the guiding principle of geography in Germany, and all over the English-speaking world following the publication of Hartshorne's *Nature of Geography* (1939). As such, Hettner rather than Richthofen has come to be remembered as the father figure in the contemporary revival of the concept of geography

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as a chorological science. Hettner was the first geographer of his generation who entered university with the conscious intention of becoming a geographer. During 1877-1878 he studied at the university of Halle under Kirchhoff from whom he had received the first clear insight into the field of geography. From Halle he went to Bonn and then to Strasbourg where, under Gerland in 1881, he obtained his doctorate on the climate of Chile. While studying at Strasbourg, he became deeply interested in philosophy, a fact that (according to Dickinson) explains his subsequent publication of essays on the framework and methods of geography—the set of writings that Hettner himself estimated as his most important contribution.

Hettner went to Colombia in 1882 as private tutor to the British Ambassador in Bogota, but returned to Germany in 1884 to join Richthofen's *Kolloquium* at Leipzig, and subsequently submitted his research for *habilitation* under the guidance of Ratzel who had by that time succeeded Richthofen at Leipzig after the latter moved out to Berlin to occupy the new chair in physical geography. In 1888, Hettner proceeded on an extensive tour of South America but returned to Leipzig to take up an academic appointment under Ratzel in 1890-1891. He remained there until 1897 when he moved over to Tubingen and from there to Heidelberg where he spent the rest of his career from 1899–1928.

During his long professional career, Hettner authored many books and papers on various aspects of geography. These included *Travel in the Colombian Andes* (1888), *Regional Geography of Europe* (1907), *Comparative Regional Geography* (1933–1935), and the posthumously published *Geography of Man,* comprised of three parts entitled respectively as: *Basis of the Geography of Man, Transport Geography,* and *Economic Geography.* His other works included one on *Russia* (1905), *England's World Domination and War* (1915), *Surface Forms of the Continents* (1921 and 1928) and the *Spread of Culture over the Earth* (1928, 1929). Hettner's methodological essays (beginning with his paper in the inaugural issue of *Geographische Zeitschrift* that he founded in 1895 and continued to edit until 1935) were collected and published (with an introduction on the history of geographical thought) as a book in 1927 bearing the title: *Geography: Its History, Character and Method* (*Die Geographie Ihre Geschchte Ihr Wesen und Ihre Methoden*). The rest of this discussion relates to his methodological ideas as contained in these essays.

Hettner subscribed to a view of classification of sciences and the placing of geography as a science that was similar to Kant's view on the subject (though Hettner made no reference to Kant). The failure to make any reference to Kant was possibly because at the time when Hettner was writing his methodological essays, this view was so widely accepted that it did not require support from the earlier methodological literature.

Hettner noted that on the one hand we have a *logical classification* of fields of learning, according to which we have a series of subject-sciences each concerned with the study and analysis of a logically defined circle of facts. On the other, we have a *physical classification* of fields of knowledge according to which fields of study are defined *not* on the basis of logical

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unity of the subject matter concerned, but on the basis of the physical association of phenomena of diverse origin existing together. The physical association (or arrangement) of phenomena may be viewed in two different dimensions: Time and space. Accordingly, physical classification of knowledge gives us two groups of fields of study, namely, historical sciences, which study integrations of diverse phenomena occurring together in the context of time (i.e., historical period); and chorological sciences which study diverse phenomena existing together in segments of the earth's space. This idea had been put forward by Hettner in the first of his methodological essays published in the inaugural issue of his journal *Geographische Zeitschrift*, in 1895. According to him:

> If we compare the different sciences we will find that while in many of them the unity lies in the materials of study, in the others it lies in the method of study. Geography belongs to the latter group; its unity is in its method. As history...consider(s) the development of the human race... in terms of time, so geography proceeds from the viewpoint of spatial variations.

Hettner noted that a historical survey of the development of geography reveals that there are two interrelated views regarding its nature as a field of knowledge. According to one, geography was viewed as a general science of the earth so that study of general geography (study of the earth as a planet) was primary, and study of special geography (i.e., in-depth study of particular segments of the earth's surface) was secondary. This was sharply contrasted to the second view, which saw geography as the study of the earth's surface as the home of man, and by inference, the areal character of the earth surface (and its regions) was the primary task of geography, and general or comparative geography was regarded to be of secondary concern. Hettner pointed out that the controversy regarding the primacy of general or special geography was based on an erroneous view of the nature of acquisition of knowledge. He underlined that since historical and spatial approaches to acquiring knowledge stand out in clear distinction from the systematic study of particular sets of logically defined data (studied in the subject-sciences), geography, like history, stands out as an essential and autonomous component of a complete system of sciences. History and geography owe their unity as fields of knowledge not to their subject matter but to their way of looking at phenomena on the earth's surface. History and geography are methodologically defined branches of learning.

Tracing the development of geography from the time of the ancient Greeks, Hettner asserted that geography is the chorological science of the earth's surface. As such, geography is concerned with the study of areas on the earth's surface insofar as these have material content. It describes places and regions, and analyzes their spatial interrelations. In this, geography is somewhat similar to, but distinct from, history which describes the sequence of events in given places (or countries) and analyses development of things (or the changing relationships between phenomena) over time.

Although Hettner had taken up the chorological concept of geography

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from his teacher and colleague Richthofen, he nevertheless criticized his view of geography as the science of the earth's surface as vague and ambiguous. Hettner maintained that geography is properly described as the study of the earth's surface according to its localized differences such as between continents, regions, districts, and localities. Geography, according to Hettner, seeks to define and describe unit areas of the earth's surface and to compare them on an inductive worldwide basis. Whether the student is engaged in the study of particular areas and regions, or in a comparative study of several of them, the differential association of phenomena over the earth surface is the keynote in the study of geography as a science.

Hettner was critical of the attempts by some geographers to project geography as the "science of distributions" (Hartshorne, 1939, pp. 127–129). He maintained that geography was not necessarily concerned with distributions of particular phenomena *per se*, since logically speaking that is the special concern of the systematic sciences under whose domain the respective phenomena fall (e.g., plants—botany; animals—zoology). The problem becomes of geographical interest only when such a distribution is an element of an areal association of phenomena that gives character to an area or region. In this regard, Hettner drew attention to the distinction that A.R. Wallace (Darwin's coauthor in the theory of natural selection) had made between geographical zoology that studies the distribution of individual species of animals, and a zoological geography that is concerned with faunal content of different lands. The same holds true of plants, minerals and other elements forming the subject matter of the systematic sciences. Whereas the view of a systematic science is focused on a particular category of phenomena which it studies in terms of their distribution, the focus of attention in geography is on areas which it studies in terms of differences in their mineral, floral, and faunal content. As Hartshorne has noted, this concept of geography represented a consistent derivation from Humboldt's description of geography as the study of "that which exists together in an area".

Geography, according to Hettner, begins with the spatial association of phenomena that give character to areas at different scales of resolution. Geography involves consideration of causal interdependence (*Zusammenhang*) of various sets of spatially arranged phenomena in particular segments of the earth's surface; individual distributions by themselves are of little significance in giving character to areas and as such are of little direct concern to geography as a specialized discipline. However, single distribution becomes important in characterizing an area insofar as it is coincident with other areal phenomena with similar areal distribution i.e., to the extent that the distribution of single elements is geographically (or spatially) efficacious.

Like Richthofen, Hettner also used the chorological view of geography as a means to an end—to resolve the problem of dualism between physical vis-a-vis human geography. To quote him, geography as a chorological study "is neither natural nor human...but both together", for it is concerned with the "distinctive character of lands", since the character of any region

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with a history of human settlement incorporated both physical as well as human aspects, both types of elements formed equally important components of geographical study. He criticized the likes of Peschel and Gerland who wanted to project geography as a purely physical science. He was also critical of Ritter and his followers who wanted to make man the central focus of geography. Hettner emphasized that man must be considered alongside nature in the study of areal descriptions and interrelations.

Hettner addressed the question whether geography should confine its vision to the study of geographical areas as unique entities, or also concern itself with the formulation of general concepts and theories i.e., is geography idiographic or nomothetic in perspective? His own answer was, that like all other fields of scientific knowledge geography must be concerned both with the uniqueness of particular phenomena as well as the general principles that explain the particular examples. Geography is concerned both with the unique character of particular areas as well as the elements of similarity or universality between them. The in-depth study of particular regions can be effectively pursued only when it is suitably illuminated by the relevant general concepts which would frequently be necessary to identify their uniqueness. Likewise, the study of areas as unique assemblages of diverse phenomena provides raw material for general studies, since every unique element is a challenge that leads to the search for better theory.

Richthofen's programme of geography, and its further exposition by Hettner paved the way for studies in regional geography interpreted in terms of the fruits of systematic geography. In methodological terms, this represented a return to Humboldt's approach to geography, an approach that was neglected by the followers of Ritter who pursued regional geography with relatively little concern for systematic geography. It is true that Hettner consistently encouraged the study of regional geography, but that should not be interpreted to imply that he discouraged systematic geography because he consistently emphasized the need for geographic work from both the perspectives. As Hartshorne (1939, pp. 93–95) wrote, it is significant to note that regional study in geography in Germany had hardly reached a position comparable with systematic studies until after the First World War which led to a refocusing of interest on the geographic character of different parts of Europe in general, and the Germanic lands in particular.

The standard approach to regional study in geography, which had served as the general framework for many scholarly works in Germany published from the 1880s to the 1920s, was described by Hettner in an article in *Geographische Zeitschrift* (1933). Under this framework, various categories of facts were examined in their geographical distribution starting with geographical location, geology, relief, climate, natural resources, development and distribution of population and settlements, the forms of economy, trade, transport, and political divisions. This outline was based on the belief that the framework formed a kind of sequence of cause and effect. The framework had continued to be pursued as the model approach

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to regional study in geography in Germany for a long time. Through Hartshorne's *Nature of Geography* it became the standard framework for regional geography in the English-speaking world.

Although the chorological view of geography had become the dominant concept of geography in the working life of Hettner, it is significant to note that the chorological concept of the discipline had only *upstaged* and not *replaced* the Ratzelian view of geography as the study of man-land relationships. Indeed, in many parts of the English-speaking world, the Ratzelian concept had continued to be vigorously pursued under the influence of the highly pursuasive writings of Ellen Churchill Semple.

GEOGRAPHY AS A LANDSCAPE SCIENCE

Otto Schluter (1872–1952)

Notwithstanding the considerable popularity of the concept of geography as the study of earth's areas in terms of what Sauer called "areal differentiation", many geographers felt uneasy about the identification of geography as a chorological science which like the chronological sciences (e.g., history) was defined in terms of its method rather than its subject matter. They strongly felt that geography, like other systematic sciences, must have a distinctive subject of study with which it could be clearly identified as a field of science. Another source of dissatisfaction was the Hettnerian schema for regional geography which appeared to overemphasize the importance of Physical features in the geography of regions and places. By tying every aspect of an area back to its physical features, the Hettnerian model for regional studies had tended to overlook the role of factors such as distribution and density of population, economy, patterns of development in relation to routes of circulation, and a host of historical-cultural forces and factors that impart individuality to places irrespective of the physical environment. A third source of dissatisfaction was that many of the interrelations observed in regional studies were in the process of change over time. These could not be properly understood without the study of past geographies of the place, and the changes taking place over a period. In other words, geography as chorology neglected time.

These points of dissatisfaction with the concepts of geography put forward by Ratzel, on the one hand, and Richthofen and Hettner on the other, had led to a continued search for alternative concepts of geography as a science. An alternative view was built around the concept of landscape which had first been introduced by Wimmer in 1885 in his *Historische Landschaftkunde*. But it gained popularity only after 1906 following its further exposition by Otto Schluter. Born in Westphalia in 1872, Schluter first studied German language and history but while a student at the university of Halle he attended the lectures of Kirchhoff on human geography. This led to a change of his interest from Germanic studies to geography. Schluter wrote his dissertation at Halle, but shifted to Berlin in 1895 to study under

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Richthofen, under whose influence he developed a strong interest in questions of scope and method of geography, an interest that led him to his famous "Objectives of the Geography of Man" (1906) which projected the alternative concept of geography as the study of landscapes. Five years later he was appointed to the chair of geography at the university of Halle where he stayed until his retirement in 1951. Schluter was keenly interested in the geography of the settlements in Central Europe. The result of his nearly forty years of labour on this subject was published in a three-volume work under the title *Siedlungsraume Mittelenuropas in Fruhgeschichtlicher Zeit* (1952, 1953, 1958).

In his 1906 methodological paper, Schluter had suggested that geographers should concentrate on the study of phenomena on the surface of the earth that could be perceived through the senses; and the focus should be on the totality of perception in each area. This totality of "visual perception of area" was termed as landscape. According to him, acceptance of landscape as the subject matter of geography had raised the discipline to the level of the other logically defined fields of science.

Since the concept of landscape was based on visual perception of the surface features in given areas, the nonmaterial content of areas, such as political organization, religious-cultural beliefs, economic institutions and the like, lay outside the central focus of geography as a science. Schluter wrote that knowledge about these aspects could be borrowed from the relevant fields of knowledge, and used in interpreting the landscape which, like an architectural deposit, mirrors the culture and economy of the human communities inhabiting the particular segments of the earth's surface. Interest in political, cultural, and economic aspects was, however, to be limited only to the extent that they gave character to the visible landscape.

Schluter incorporated the concept of process i.e., development through time, in his concept of geography as the science of landscape by means of the derivative concepts of cultural and natural landscapes. He called them as *Kulturlandschaft* and *Naturlandschaft*. For him the purpose of the study of landscapes was "not only of classifying categories of phenomena and determining their distribution and associations, but of examining their characteristics through the process of change through time". He emphasized that human geography should aim at the recognition of the form and arrangement of earthbound phenomena as far as they are perceptible to the senses. He claimed that his method of study was morphological, and its procedure was parallel to that of the study of landforms.

Like physiography, human geography as the science of landscapes was concerned *not* with the processes i.e., the mechanisms that create the landscape, but only with the surface expression of these processes. Schluter noted that the cultural landscape embraces both mobile and immobile forms. The immobile forms required explanation in terms of "all the effects of which every period and every culture, according to the measure of its forces, has wrought upon the landscape". The mobile forms included man, together with his works and his movement. In other words, the cultural

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landscape requires the study of not only the routes and route patterns, but also the men and materials that move along them.

Schluter's concept implied that each small unit of areal association constitutes a physiographic unit in which all the perceptible phenomena together constitute distinct association; and as far as cultural landscapes are concerned, the association is rooted in similarities of function or common origin. This implied that in the study of cultural landscapes, the primary focus was on the morphology of landscapes rather than on causal association of the phenomena. Also, the landscape geography of Schluter demanded that the study of cultural landscape be pursued in terms of its historical evolution in relation to the original natural landscape of that area. This meant that the areal grouping of elements in the present-day landscape are to be explained with reference to the way they are tied together in the current functional organization of the area, and in terms of their genetic evolution through past survivals in the landscape. It is important to note that the morphological approach of Schluter represented a fundamental departure from the Darwinist environmentalism that underlay the concepts and methods of W.M. Davis, H.R. Mill and some of his other contemporaries.

Although the concepts of Hettner and Schluter appear somewhat antithetical on first sight, a closer scrutiny reveals otherwise.

> The regional concept...of Schluter, like that of Hettner, is about a geographical portion of the earth's surface that stands out from its surroundings. Hettner stressed the *Wesen* or personality of an area as based upon the similarities of contiguous places and their phenomena, and the spatial and causal cohesion of the various natural elements in this area. Schluter stresses the *Bild*, the association or assemblage in space of landscape elements as the essence of this landscape unit (Dickinson, 1969, pp. 132-133).

Both Hettner and Schluter were concerned about the variations in the character of areas on the earth's surface—which became known as *areal differentiation*. Both of them recognized that there were distinctly different kinds of areas on the earth, and that these were distinct from their surroundings in that they showed a certain degree of uniqueness that could be defined. "Hettner, however, stressed the ways in which the features of a region reflected the basic patterns of the physical earth, whereas Schluter focused attention on the interrelations of these features that gave the region its distinctive appearance" (James, 1972, p. 230).

The followers of the concept of geography as landscape science were far from precise in their concept of landscape, leading to a good deal of confusion. The term landscape (*Landschaft*) has two distinct meanings in the German language: one, in the sense of a distinct territory with a generally uniform aspect; and the other, in the sense in which it is used by artists to refer to the aspect of the earth as seen in perspective (as in a painting or a photograph) without connotation of areal extent. Interchangeable use of the term in both the senses by the landscape geographers had led to a lot

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of confusion so that the concept became, according to Hartshorne, surrounded by a "mystical significance". Lack of a clear definition as to the scope of geography as a landscape science was another source of confusion: While Schluter himself conceptualized landscape as the total impact of an area on man's sense perception so that even invisible phenomena, such as wind and temperature, were included; some other scholars who followed him chose to restrict the term to only the visible landscape and excluded anything, such as wind and temperature which cannot be seen, from consideration. There were still others who wanted to broaden the scope of landscape to include everything, including law, religion, and political and economic institutions.

In a critical appraisal of Schluter's contribution, Leo Waibel (1933) wrote: Through

> the concept of the physiognomic build of the landscape, he gave the geography of man a corporate substance for research, which can be worked out according to the same method as physical geography—the cultural landscape. This can be examined from the standpoints of its morphology, physiology, and developmental history, just as the visible phenomena in nature in the build of the landscape. Between physical geography and the geography of man, there is no longer a gap. Both are in the closest contact in terms of objects and methods (cited in Dickinson, 1969, p. 132).

The concept of landscape and the related methodological principles of Schluter had been widely used by German geographers before the Second World War. Writing in 1952, German geographer Lautensauch reported that most geographers in Germany followed Schluter in identifying the study of landscape as the central task of geography: The German methodologists viewed every landscape as a "dynamic structure, a thing-area-time system of specified quality inside the whole geosphere—that is, an open system, as contrasted to the closed system of organism" (cited in James, 1972, p. 232).

Jean Brunhes was advocating a somewhat similar set of ideas in France, but it had made very little impact in the English-speaking world until Carl Sauer introduced the concept in his essay on "The Morphology of Landscape" (1925), and later built a research group (the Berkeley School) that focused on the historical-ecological study of cultural landscapes. This concept was completely ignored in Britain so that Darby's (1936) edited volume made only a passing reference to Brunhes. Even in the United States the concept was not pursued outside the Berkeley School. Part of the reason lay in the widespread influence of Hartshorne's *Nature of Geography* (1939) which had convincingly argued in favour of the Hettnerian paradigm of geography as the time-honoured concept of the discipline.

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Geography after Humboldt and Ritter: Developments Outside Germany

Geography had been firmly established as an academic discipline in Germany following large-scale endowment of chairs in geography in many universities across the country. The revival of geography, however, took some time to spread to other parts of Europe, and to the United States. There was, in general, a lapse of a decade or more. Before long, geography had begun to appear as a subject of higher learning in most European universities. The part played by the universities in the formation of geography as a professional discipline was of fundamental importance since only through the training of the younger generations in an accepted mode of study could geography emerge as a professional field.

DEVELOPMENTS IN FRANCE

The immediate cause for the revival of geography as a university level subject of study in France was the country's defeat in the Franco-Prussian war of 1870-1871. Soon after the war there was a great demand for better quality geography education in the French schools, with a view to stimulating interest in the knowledge about peoples and places in far-off lands so that the pursuit of colonialism could be attended to more effectively. The country's defeat, and the loss of territory, made it urgent that France should look to Africa and elsewhere for commercial opportunities and politico-cultural colonization (Freeman, 1971, p. 46). The development of French colonial power after 1871 owed a great deal to the influence of the French geographical societies (McKay, 1943).

Contributions of Vidal de la Blache (1845–1918)

Unlike in Germany (where revival of geography in the last quarter of the nineteenth century had been marked by the rise of several distinct schools of thought), the growth of modern geography in France was shaped by the work of one man, Paul Vidal de la Blache, who founded a new school of thought in human geography that remained dominant until the Second World War. Writing in 1922, W.L.G. Joerg had noted that "Nearly all occupants of chairs in geography in France are pupils or pupils of pupils

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of the late Vidal de la Blache. In no other country...the development of geography centred about one man as in France".

Blache had come to geography via history and literature. After a doctorate in history in 1872, he began teaching geography, first at the university of Nancy (1872–1877), and later as professor of geography at Ecole Normale Superiere in Paris. He became the first geographer to be appointed to the chair of geography at the Sorbonne in 1898. As a contemporary of Ratzel, it was quite natural that Vidal de la Blache should be influenced by his writings. It was not Ratzel of the first volume of *Anthropogeographie* (1882) but Ratzel of the second volume (published in 1891) that attracted Vidal. He was drawn to Ratzel's concern with geographical distribution of man, and the role of migration (and inherited traits) in man's adjustment to nature. This basic concept became the central theme in Vidal's own concept of *possibilism,* which held that nature sets limits and offers possibilities for development, but the way man adjusts to the natural conditions of the area of his inhabitance is largely a function of his own tradition and mental structuring. The same environment carries different meanings to people with different *genres de vie* (ways of living or culture). According to Blache, culture (i.e., inherited traits) is the basic factor in determining which of the many possibilities in the natural environment shall be selected by a given community.

Blache was opposed to the concept of dichotomy between natural and cultural aspects of geography. To him, consideration of natural and cultural aspects of the earth's surface cannot be separated from one another for the simple reason that in every inhabited part of the earth's surface, the original landscape is significantly transformed as a result of human habitation. Such changes are greater in the case of culturally advanced societies where, owing to the more developed technology, the degree of man's intervention in nature is more far-reaching. It is, therefore, impossible to study landscapes meaningfully without due reference to the interlocking roles of nature and culture.

The relationship of a community to the physical landscape of the area of its inhabitance is so intimate that it is difficult to think of the one without the other. As such, each segment of the cultural landscape has, with the passage of time, acquired a unique personality of its own. Such areas were named as the *pays*. According to Blache, the study of such regions constituted the primary task of geography as a professional field. Elaborating upon his idea about the method of geographical enquiry, Blache (1913) stated that geography is "the study of things associated in areas, mutually interacting, characterizing particular segments of the earth space". According to him, the distinguishing feature of geography as a science was its "capacity not to break apart what nature has assembled, to understand the correspondence and correlation of things" existing together in association in particular regions or pays.

Blache's method of study was essentially inductive and historical. It was designed to suit the study of small areas of self-sufficient economies

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as had existed in the nineteenth century rural France. An agricultural way of life pursued in relative isolation from the outside world had favoured the development of locally distinctive traditions and ways of life (*genre de vie*), including agricultural practices, implements, food habits, dress and architecture. Blache recommended that geographers should carry out research in folk cultures with a view to depicting the unique personality of each region.

Commenting on the role of history in the development of *pays*, Blache cited the example of a pond being swept by a gust of wind. As the wind overtakes it, the water of the pond gets disturbed and there is all-round confusion, but after a few minutes the ripples subside, and the old calm is restored. In like manner, war, pestilence, and civil strife can interrupt the forward progress of a region and bring chaos, but with the passage of time the crisis is overcome, and the old pattern of civic life is reestablished. This original idea, first formulated in 1903, was illustrated in his 1917 work on the two thousand years of development in Alsace and Lorraine. He demonstrated how the French Revolution of 1789 had produced a great ripple in the placid waters, as it were, but before long the usual processes of development had reasserted themselves. However, as an honest researcher (who is partial to truth rather than to his own pet theory), Blache did concede that after about 1846 the balance of interplay between man and nature had been fundamentally disturbed as a result of the introduction of new technologies that had enabled man to tame the forces of nature—technologies which enabled the building of canals, and broke the isolation of rural communities through laying of roads and railroads, and above all, through the launching of the industrial revolution. All this posed a serious threat to the maintenance of age-old traditions born out of self-sufficient economies of the individual pays. This meant that by the end of the nineteenth century the method of regional study in terms of *genre de vie*, as advocated by Blache, was fast losing relevance to the study of European landscapes. Blache was nostalgic about it, but the scholar in him suggested a new approach more suited to the study of the changed scenario. He wrote that "The idea of region in its modern form is a conception to do with industry; it is associated with that of the industrial metropolis". He clearly perceived that the organizing principle of economic life in the future would be guided by the relationship of an area to the metropolitan centre that dominates its economy, rather than the relationship between man and his local environment.

It has been rightly noted that the method of regional study developed by Blache "was a powerful and legitimate vision of the functioning of societies during most of European history. It was, however, ironically, a vision of the things past or about to pass, not a vision of things present or to come" (Wrigley, 1965, p. 9). As such, Blache's method of regional study provided a most appropriate methodology for historical geography of Europe before the Industrial Revolution, and it may still be relevant to the limited but rapidly shrinking areas of the world today whose economies may still

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be dominated by peasant agriculture and local self-sufficiency in most material requirements of life, but it cannot be applicable to a country which has undergone industrial revolution (Wrigley, *op. cit.*).

Vidal de la Blache passed away in 1918. Around that time, he had been engaged in assembling a definitive book on human geography with a view to concretizing his philosophy and methodology of the geography of man. From his partially completed manuscript his former student (and son-in-law), Emmanuel de Mortonne, prepared the press copy of the book which was published in 1921 under the title *Principes de Geographie Humaine* (translated into English as *Principles of Human Geography*).

In an article published in 1913 in the *Annales de Geographie* (which he had founded and edited until his death) Blache had outlined the "distinguishing characteristics of geography", wherein he wrote that the goal of geographical study was to study the nature and groupings of phenomena of landscapes as the expression of man's interaction with nature. Listing the distinctive characteristics of geography he mentioned the following:

- The concept of terrestrial unity is the starting point in geographical work. Geography pursues a synthetic world view of nature and man. It also studies causes and generic types of groupings of terrestrial phenomena.
- Geography believes that terrestrial phenomena are localized in varied combinations both in nature as well as in the modifications brought about by human intervention.
- Geography seeks to describe, localize, and explain covariations between natural conditions and man-made phenomena.
- Geography seeks to measure the influence of environment (especially climate and vegetation) on man.
- Geography is concerned with developing and refining methods of defining and classifying earth phenomena.
- Geography seeks to measure and localize the part played by man in modifying the face of the earth.

La Tradition Vidalienne

For almost half a century French geography had remained a faithful reflection of the Vidalian tradition of thought and methodology perpetuated by his own students and the next generation trained by those students as they spread out to man the various university departments across the country. The essence of the Vidalian tradition was an unswerving faith in the principle of terrestrial unity so that the concept of dualism between man and nature, and human and physical geography, was alien to the French tradition in geography. French geographers have all through maintained a balance between physical and human components of geography. Thus, of the two leading disciples of Blache (each a leader in his own right), while Jean

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Brunhes (1869–1930) spread the message and methodology of new geography of man as preached by his master, Emmanuel de Mortonne (1873–1955), was a leading physical geographer.

Brunhes was a leading geographer in his own right. His book *La Geographie Humaine,* first published in 1910, went through several editions over the next quarter of a century. An English translation (edited by Bowman) was published in 1920. The book became so popular in North America that an abridged edition was published in 1952. Brunhes proposed a classification of geographic facts that made Blache's concepts easier to transmit in the classroom. Brunhes wrote that the two basic maps for the study of human geography are a map of water and a map of population. According to him the essential facts of human geography may be classified into three groups namely

- Facts of the unproductive occupation of the soil (houses, roads, and settlements);
- Facts of plants and animal conquest (cultivation of plants, and animal husbandry);
- Facts of destructive exploitation (clearing of forests, hunting, and mining).

The last part of Brunhes's book contained a discussion on different kinds of geographical studies pursued under the headings of human geography, regional geography, social geography, political geography and historical geography.

Emmanuel de Mortonne was a leading physical geographer of his time. He held physical geography to be an essential part of the scheme of geographical study of areas. He maintained a consistent interest in geomorphology and climatology. He combined this interest with regional expertise in the geography of Central Europe. One of the most influential geographers of the interwar period in Europe, de Mortonne was a strong supporter of Davisian geomorphology which he popularized in the French academic circles. His 1927 study on the identification of arid regions through the use of aridity index, was a major contribution to the study of climate.

An important part of the Vidalian tradition was the recognition that while from one point of view geography is a unitary field, from another it appears to tie together a variety of fields in the natural and human sciences. In a book entitled *Science of Geography* (1925) Camille Vallaux (1870–1945) stated that geography is both a unitary and autonomous field of study, and also an auxiliary aspect of many other fields of scientific knowledge. Thus, not only does geography have a philosophy of its own, "it is almost, in itself, a philosophy of the world of man". This explains how the Vidalian tradition had succeeded in making important contributions to systematic aspects of geography (i.e., topical studies) side by side with its unique contribution to regional geography pursued through the concept of *genre de vie* which had resulted in the justly famous French regional monographs "the study of places" (Harrison-Church, 1951; James, 1972; Livingstone, 1992).

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Another distinctive aspect of the Vidalian tradition in geography was that Blache had regarded field study of small areas as the best possible way to train geographers. He was convinced of the great practical value of such regional studies to society and government. With a view to fulfilling this need, Vidal had planned a series of books on regional geography covering the whole of Europe—a new series of universal geographies. However, Blache passed away before the plan could be concretized so that the task was taken over by his student and close associate Lucien Gallois (1857–1941). The first volume appeared in 1927, and the series had been completed (except for the volume on France) before the out break of the Second World War. The series is regarded as a monument to the regional tradition in geography.

DEVELOPMENTS IN GREAT BRITAIN

In the nineteenth century British geography had suffered from maladies similar to the ones that had beset it in France. Much of what was taught in British schools in the name of geography was uninteresting and dull; and the students were required to commit to memory a large mass of unorganized facts. As in France, courses in geography in the universities were handled by geologists on the physical side, and the courses meant to provide geographical background to history were taught by historians. The overall scene was extremely confusing. In the midst of this confusion Mary Somerville (1780–1872) appeared as a bright star and shone on the path to development of geography as a field of scientific enquiry in its own right. Her famous book on *Physical Geography* was published in 1848. It went through seven editions over the next thirty years. This book started with a physical description of the earth's surface—continents, oceans, atmosphere, plants and animals—and included the study of man as an agent of change in the physical landscape. The author kept on updating the book with each edition by incorporating new facts as they became available. Its sound methodology and approach received praise even from Humboldt (Freeman, 1971, p. 28) but irrespective of its sound method and the author's erudition, the book failed to create a stir in British geographical circles since it was published at a time when physical geography was claimed by geologists, and Humboldt's books were supposed to have said everything that needed to be told about geography. Ironically enough, the book became highly influential in North America through George Perkin Marsh who found her observations about man's destructive use of the earth very stimulating. (For short appraisal, see: Livingstone, 1992, pp. 272–274.)

Another major figure in the history of nineteenth century British geography was Francis Galton (1822–1911) who was a member of the Council of the Royal Geographical Society in London from 1854–1893. He had prepared the first weather map of Britain in 1861, and was the first scholar to demonstrate that weather patterns could be revealed by plotting lines of equal air pressure on the map. He was also the first to identify the nature

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of air circulation in an anticyclonic formation. He further refined his isopleth technique to prepare the first ever isochronous map showing lines of equal travel-time from London. Commenting upon the nature of geography Galton (1855, p. 81) described it as "a peculiarly liberalizing pursuit, which links the scattered sciences together, and gives each of them a meaning and significance of which they are barren when they stand alone" (cited in James, 1972, p. 257).

While geography was making news through the contributions of individual scholars like Somerville and Galton, until the 1880s the discipline had no place as a branch of learning in the British universities. In 1884 the Royal Geographical Society asked its secretary, John Scott Keltie to survey the status of geography in Great Britain in the light of the contemporary status of the discipline in Germany, France, and U.S.A. Keltie reported that the status of geography in Britain compared very unfavourably with its status in other leading European countries and in America where the subject was flourishing as a university-level discipline under the charge of full professors of geography. On the initiative of the society (and induced by a special grant offered by it), the university of Oxford introduced geography in 1887 with Halford J. Mackinder (1861–1947) as reader and chairman. The university of Cambridge followed suit in 1888 under Francis Henry Hill Guillemard (1852–1933) who was succeeded by John Young Buchanan in 1889.

As was the case in Germany and France, in Britain also expansion of geography as a university-level discipline was intimately related to the needs of British imperialism. A memorandum issued by the Royal Geographical Society had urged the promotion of geographical knowledge in Britain since

> The colonies of England, and her commerce, her emigrations, her wars, her missionaries, and her scientific explorers bring her into contact with all parts of the globe, and it is, therefore, a matter of imperial importance that no reasonable means should be neglected of training her youths in sound geographical knowledge (Proceedings of the Royal Geographical Society, 1879, pp. 261–264; cited in Freeman, 1980, p. 35).

Contribution of Halford J. Mackinder (1861–1947)

Mackinder's training as an academic included a first class honours in natural sciences at Oxford in 1883, followed by graduation in history from the same university in 1884. He studied law and was called to the bar in 1886. He was one of the organizers of the Oxford University Extension Movement which aimed at taking university teaching beyond the university campus by means of travelling lecturers. Participating in the extension programme Mackinder had given 600 popular lectures in course of a few years on the theme "the new geography" in cities and towns all over the country. In 1887 he was invited by the Royal Geographical Society to deliver a lecture on "The Scope and Method of Geography". Impressed by his erudition and scholarship, the Society offered him appointment as Reader to organize

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the first university department in the subject in Britain at Oxford. He continued in that position until 1905. While still at Oxford, he did part-time teaching at the London School of Economics, of which he became the Director in 1903 and continued in that position until 1908.

As a trained historian, Mackinder was convinced that since everything must occur at a specific time in a particular place, history (which specializes in the time dimension) and geography (which is the spatial science of the earth's surface) should never be separated. The concept of geography that he presented before the Royal Geographical Society in 1887 was of a field that is concerned with the study of interactions between man and his environment. His geography was less interested in the details of man-land relations than in the development of a world view so that his book *Britain and the British Seas* (1902) was aptly described as a "regional study in a global context". It is this interest in the study of a world view that subsequently got concretized into his famous theory of the "Heartland" or "The Geographical Pivot of History", the title under which it was originally presented in 1904.

Through his writings and addresses, Mackinder became a major influence in British geography. In his presidential address to the Geography Section (E) of the British Association of Science in 1895 under the title "Modern Geography: German and English", he stated that while British geography could be proud of its contribution to field survey, hydrography, climatology, and biogeography, as regards the "synthetic, philosophical and...educational side of the subject" the British contribution fell "so markedly below the foreign and especially the German standard". The main points in Mackinder's view of geography as a field of learning, as evidenced by his presidential address may be summarized as follows.

On the relationship between systematic and regional studies in geography Mackinder stated that in his view "treatment by regions is a more thorough test of the logic of the geographical argument than is the treatment by types of phenomena". In this regard he commended the effort made by Alexander von Humboldt who "for the first time" made "an exhaustive attempt to [causally] relate...relief, climate, vegetation, fauna and the various human activities" in particular places.

Mackinder did not in any way undervalue the contribution of the systematic approach to geographical inquiry. He noted that regional surveys could be made on the basis of systematic geography. Since scientific analysis of the environment depended on geomorphology, "geophysiology" (oceanography and climatology) and biogeography, any one studying human geography in the regional context needed the knowledge of the environment gathered by systematic studies of its different aspects.

Not aware of the concept of cultural borrowings through migrations in contemporary France, Mackinder drew attention to the role of migration as an instrument of geographical change, noting that although human communities were influenced by the geographical environment, their traditions and practices in relation to the use of the environment are derived

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from cumulative wisdom resulting from past experience so that by exercising ingenuity, human groups are able to maintain themselves even in the midst of very unfavourable natural environment: The student of geography must remember, therefore, that man's progress on earth is influenced by two sets of factors—natural environment, and cultural tradition forming part of man's mental equipment.

Mackinder emphasized the need for geographers to pay due attention to the economic aspects of life in particular places as an essential component of human geography. He also laid emphasis on the study of political geography. He regarded politics as an expression of the corporate spirit of a nation (here the influence of Ratzel's theory of the state is obvious). His political geography was based on economic and strategic considerations (see Freeman, 1980, pp. 51–53; and Freeman, 1971, pp. 65-66).

Referring to what he regarded as the distinguishing traits of an "ideal" geographer, Mackinder (1895) stated that

> [An ideal geographer] is a man of trained imagination, more especially with the power of visualizing forms and movements in space of three dimensions...he has an artistic appreciation of landforms... he is able to depict such forms on the map and to read them when depicted by others;...he can visualize the play and conflicts of the fluids over and around the solid forms; he can visualize an environment, the local resultant of worldwide systems; he can picture the movement of communities... acting and reacting on the communities around.

The fact remains that as a regional geographer, Mackinder was clearly "outclassed by many people working at his time, particularly by Vidal de la Blache (1845–1918), yet he did a great deal to encourage regional geography in Britain" (Freeman, 1980, p. 52).

Contribution of Patrick Geddes (1854–1934)

Another geographer who made a lasting impact on British geography was Patrick Geddes. In an essay published in 1898 he expressed views about the nature of geography comparable to those of Mackinder (1895), but from a biological perspective, as contrasted to Mackinder's historical perspective. A botanist by training, Geddes was greatly influenced by the Darwinian idea of "ordered evolutionary unity". He had been attracted to geography with a view to investigating the possible relationships between relief, climate, and natural resources on the one hand and the distribution of various communities, their economic pursuit, and cultural development, on the other. He was deeply interested in finding an answer to the question: How has nature determined, and how has man reacted to his environment? For an answer, Geddes focused attention on the study of human activities (Robson, 1981). Influenced by the ideas of the French sociologist Frederic le Play (1806–1882), Geddes developed a methodology for the study of human communities through focused attention on the "Place-Work-Family (Folk)" progression: The essence of his methodology was that place (i.e., environment) determines the pattern of economic life, which, in turn,

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determines family norms and social structures. In the case of certain communities of advanced cultures, the steps could be reversed: Folk-Work-Place.

Geddes was a great advocate of learning and imparting education through regional surveys. His famous slogan was "Survey before action". Thus, "Geddes has remained a source of fascination to many people, and his ideas on town planning long survived his death in 1934" (Freeman, 1980, p. 53).

Development of Mapping and Field Work

A distinguishing feature of British geography all along has been a strong tradition of field work as a method of acquiring knowledge through direct contact with reality in and around the locality one lived in. By the end of the nineteenth century, there was general agreement among British geographers that any adequate survey of the world and a proper understanding of its geography could be gained only through local study. This educational method of approaching from "the familiar to the unfamiliar" had been greatly popularised by T.H. Huxley's *Physiography*, first published in 1877. "This work defined for a generation the way in which the earth's physical features were studied in Britain; it defined also the nature of school education" (Stoddart, 1975 (1986), p. 180).

According to Huxley (1825–1895), science was "nothing but trained organized knowledge common sense beginning with observation, facts collected, proceeding to classification, facts arranged, and ending with induction, facts reasoned upon and laws deduced". His objective was "to show young people the fascination of the brook which ran through the village, or the gravel pit from which the road metals were acquired, or the ordnance map which revealed their own neighbourhood. From this basis one could work forward to an understanding of the world; without it the world would be an abstraction" (Freeman, 1980, p. 54). Training in cartographic representation of the surveyed data through sketches, drawings, and maps laid the foundation of the geographic way of analysis, and the art of mapping, in the students' mind.

The cartographic tradition in British geography was greatly aided by the mass of data collected by the world expedition of the Challenger, 1872–1876; which had provided so much material that even after 29,000 pages of its reports, and 3000 maps and plates, published in 1895, the publication was not yet complete. The Challenger publications not only laid a firm foundation of mapmaking; they were also responsible for the rise of geographical interest in various fields of environmental research such as oceanography, climatology, and plant and animal geography, besides closer interaction with geology with which geography already shared a common interest in geomorphology. Although the expedition's objective was the study of submarine relief of ocean floors, its contribution to climatology was considerable.

The ingenuity of the late nineteenth century British geographers appropriated oceanography to local field study. H.R. Mill and A.J. Herbertson

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dealt with observations of water temperature at 9.00 a.m. and 3.00 p.m. at four stations on the west coast and four on the east coast for 1890, 1891, and 1892. They found that water was warmest in August to September, and coldest in February to March. The normal monthly temperature was 15.5° F but the difference in the temperatures of the coldest and warmest months ranged between 20 to 24° F. As this ingenuous experiment showed, even oceanography could be studied by the method of local survey.

At the instance of the Royal Geographical Society, H.R. Mill published a paper on the theme of local study in 1896. In it, he advocated the publication of memoirs for each Ordinance Survey 1:6360 sheet to guide the student. These memoirs could lead to the preparation of regional memoirs. It was recommended that each memoir should include an index of names of streams along with notes on place names, calculation of mean elevation on the basis of the area enclosed between selected contours, commentary on landforms and geological structure, and the stage reached in the geographical cycle of landform evolution, soils, minerals, local magnetic conditions, climate and natural vegetation, and land use. It was also recommended that aspects of history and politics be included. All this was to be correlated on a human geographic basis with reference to settlement patterns, communication network, population distribution, and industrial development. Although Mill's suggestions were not acted upon owing to cost restraints, they underlined the distinctive spirit of contemporary methodology in British geography. It was this distinguished tradition of field survey as the basic feature of British geography that later led to the conception and successful execution of Dudley Stamp's massive programme of land utilization survey of Britain in the 1930s through the association of school-level students on a voluntary basis in a little over ten years.

As Preston James (1972, p. 266) noted, during the period of expansion following the First World War, British geography developed five distinctive characteristics. These were:

- A continuing concern with exploration;
- An emphasis on regional study of various kinds;
- Inclusion of field observation and map interpretation as essential parts of the training programme of geography students;
- An emphasis on studies in historical geography;
- An emphasis on the relevance of geographical study to economic, social, and political problems.

The foundations of each of these had been firmly laid by the end of the 1890s. That explains why Mackinder has sometimes been called the "grand old man" of British geography.

DEVELOPMENTS IN RUSSIA

The vast expanse of the Russian empire was a most potent factor in the development of geography as an institutionalized discipline. Peter the Great

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(who ruled Russia from 1682 to 1725) appreciated the need for accurate geographical information to facilitate the eastward march of the empire. State supported expeditions were sent to the east and the north to explore the vast uninhabited stretches of territory; and generous funding was provided to prepare maps of the explored regions. The main objective of these explorations was to chart out the topography, and to identify places where valuable merchandise, such as furs and precious metals could be found. Later on M.V. Limonosov (who became head of the world's first officially named Department of Geography at the Russian Academy of Sciences in 1758) pursuaded the state authorities to charge the exploring parties with the task of collecting systematic information about the physical character of land, population, and economic condition. The recognition of geography as a department in the Russian Academy of Sciences gave considerable academic prestige to geography as a useful field of scientific learning. Under the patronage of the Academy, the Department of Geography launched several schemes of regional surveys and mapping of data.

In the beginning, many of the more important projects in exploration and mapping were done under the guidance of experienced experts from Germany and France, but gradually they were replaced by the newly-trained Russian personnel. German geographer Busching was a pastor of a German Lutheran Church in St. Petersburg from 1761–1765. Portions of his *New Geography* dealing with Russia were translated into Russian, and his suggestion that the imperial territory be divided into natural regions in order to facilitate administration was quickly adopted so that by 1800, regional descriptions of a number of the regions had already been published.

By the beginning of the nineteenth century Russian geography had already developed two distinguishing characteristics. The first was an emphasis on regions as the basis for organizing geographical work, and the belief that regions are concrete entities that can be objectively defined. Second was the continued use of geography to include a wide variety of specialities. This was sharply contrasted to the contemporary trend in Germany where, in the words of James, classical geography was torn apart as each academic discipline established its separate existence. In Russia, the classical tradition of geography as a field of study dealing with the physical environment of the earth and its human inhabitants had continued. To formalize this structure of geography, the Imperial Russian Geographical Society was founded in 1845. The Society was charged with promoting work, alongside geography, in geology, meteorology, hydrology, anthropology, and archaeology. The several specialities covered under the Society were collectively identified as "the geographical sciences".

Unlike in Germany where the deaths of Humboldt and Ritter in 1859 were marked by a break in the continuity of geographical study, in Russia there was no such break. For this reason, in the case of Russian geography, it is difficult to pick up any single scholar as the "grand old man of Russian geography". However, the continuous growth of the pre-Soviet (before 1917) period suffered a serious jolt, like everything else in the country, after

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the 1917 revolution. In order to survive the persecution of the new regime, scholars were required to bring their ideas in line with the ideas of Marx and his followers, who were strong advocates of economic determinism, and were clearly opposed to any suggestion that natural environment was a potent force in shaping the life of human communities in particular areas. Given this major curb on the exercise of free thought, in the post-1917 period, development of geography as a field of learning in Russia was cut off from the concept and development of the discipline in the rest of Europe and North America. This isolation became particularly marked owing to the strong linguistic barrier. Owing to this, developments in Soviet geography since 1917 have little bearing on the conceptual development of geography as a science. For this reason, the post-1917 developments in geography in Russia need not detain us. However, as regards the pre-1917 phase in the development of geography in Russia, Petr Kropotkin, whose concept of geography as social ecology, and his concept of "mutual aid" in nature have been the object of special attention in the recent literature (Galois, 1976; Breitbart, 1981), deserves special mention.

Contributions of Petr Kropotkin (1842–1921)

Born into the Russian aristocracy, Kropotkin attended military school, and was trained for a career in the state administration. He served as the personal page of the Tsar for a short duration and the experience of service under the Tsar created a distaste for court life in the young Kropotkin so that he opted out for military service in Siberia. Here he came in direct touch with unspoiled nature and in the course of five years' service in the Siberian region, geographical exploration formed an important part of his administrative duties. In the course of his service, he came in touch with the various peasant communities living in close contact with nature. He was greatly impressed by the spirit of equality and self-sufficiency among the peasant communities. It was through the close observation of the life of peasant communities in Siberia that Kropotkin's distinctive concept of "nature" began taking shape. His encounter with the plight of Russian peasants had already aroused his conscience. These two—nature, and socially aroused conscience—were the seminal influences in the making of Kropotkin as a social geographer.

Dissatisfied with his life as a military service administrator, Kropotkin returned to St. Petersburg to enter the university to study geography and mathematics. For some time he worked for the Russian Geographical Society. To begin with, his first love was physical geography, but as time passed his scientific interests were overtaken by social geographic problems. This was not surprising in view of the social conditions prevailing in Russia in the 1860s, which had raised the conscience of many intellectuals who became drawn to the social issues of their times. The critical point in Kropotkin's case came during a visit to the Jura mountains in 1872. The region, at that time, had been one of the leading centres of anarchist activities. While there, Kropotkin came in contact with many activists of the movement and

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he too became an anarchist. This led to his joining agitational movements, being arrested, and sentenced to a prison term in Russia from where he managed to escape to France. A similar fate awaited him there. After release from a prison term in France in 1886, he came to England and stayed there until the success of the Russian Revolution in 1917. At the age of 75, Kropotkin returned to Russia where he died in 1921. In course of his long stay in England Kropotkin had served with the Royal Geographical Society in London.

Kropotkin had rapidly shaped into a distinguished physical geographer so that the Russian Geographical Society offered him the prestigeous post of secretary in 1871. Kropotkin rejected the offer, since by this time his enthusiasm for science had waned following his increased fascination for social geography, and his rising concern for social ills. Reminiscing upon his conversion from physical geography to social ecology (or social geography) Kropotkin wrote:

> Science is an excellent thing. I knew its joys and valued them—perhaps more than many of my colleagues did. Even now as I was looking at the lakes and hillocks of Finland, new and beautiful generalizations arose before my eyes...a grand picture was rising and I wanted to draw it... to open new horizons for geology and geography.
>
> But what right I had to these highest joys when all around me was nothing but misery and struggle for mouldy bits of bread; ...all those sonorous phrases about making mankind progress, while at the same time the progress-makers stay aloof from those whom they pretend to push onwards, are mere sophisms made up by minds anxious to shake off a fretting contradiction (Kropotkin, 1899, pp. 237–241).

Kropotkin's views on social geography were largely shaped by his anarchist philosophy. Social anarchism maintained firm belief in the capacity of the people to organize their life without structures of domination and subordination i.e., it reposed faith in the people's capacity to coordinate everything from the family to the economy on a cooperative basis. For anarchists, freedom was an article of faith so that they aimed at elimination of authoritarian social organization. Kropotkin believed that true individual freedom can only be cultivated by conscious and reflective interaction of people with the social environment which supports their personal freedom and growth. The essence of freedom to him was *unity in diversity,* a sense of mutual dependence on others for collective action, but with unfettered opportunity to express individual differences. His ideas were derived from his world view of nature developed in the course of his sojourn in Siberia.

Kropotkin's View of Nature and His Concept of Mutual Aid

Kropotkin was writing during the period when social Darwinism was in ascendancy, and no intellectual could escape the impact of evolutionary theories. Kropotkin's view of nature was based on three premises namely, nature is organic (i.e., holistic); it is historic; and it is spontaneous. His originality lay in the manner in which he interpreted the organic (holistic)

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characteristics of nature, especially in relation to man's place in the web of nature. This theme was the key idea and the central focus of his theory of, and his book on, *Mutual Aid* (no date). The first two chapters of the book were devoted to the discussion on mutual aid (i.e., cooperation) among animals. He demonstrated that both cooperation and competition are present in nature simultaneously, as also in the case of human communities. Thus, "man is no exception in nature", wrote Kropotkin, since the same forces operate in the "living world of nature". In his view, therefore, it was erroneous to interpret biological evolution in terms only of struggle and competition between species as the social Darwinists insisted on doing.

As one writer pointed out,

> A critical point to note here is the opposition between the holistic approach and the atomistic approach. The latter, which sees in nature a series of discrete units acting independently, was one of the fundamental tenets of the pervasive liberal ideology of the nineteenth and twentieth centuries. It permitted, not to say encouraged, partial analysis...[and] it rendered the context irrelevant. This was the view of society, and this was the view of nature, each supporting the other in a reciprocal fashion (Arblaster, 1972, paraphrased in Galois, 1976).

This is what lay behind the Social Darwinist concept of competition among organisms in nature, and was supposed to be reflected in the competitive nature of man.

Kropotkin's view of nature as "historic" was also a product of his organic view of nature, and his analogy between man and animals. He wrote that "Man did not create society; society existed before man". He emphasized that life in nature was not a timeless constant, but a product of history and historical development. His concept of spontaneity in nature implied cooperation between organisms (leading to the concept of mutual aid). The concept of spontaneity also subsumed the concept of freedom, but Kropotkin's concept of freedom differed from that of other socialists as well as from the nineteenth-century liberals. According to him, an individual "will be really free in proportion only as others around him become free" In its application to human societies, this view of nature implied that:

> ...all mutual relations of its members are regulated, not by laws, not by authorities, whether self-imposed or elected, but by mutual agreements between members of that society and the sum of social customs and habits...developing and continually readjusted in accordance with the ever-growing requirements of a free life stimulated by progress of science, invention and steady growth of higher ideals (Kropotkin, 1970, p. 357).

Kropotkin's historical research indicated that struggles for existence had been carried out not by individuals, but by groups of individuals cooperating with one another. This had led him to affirm the predominance of "mutual aid" over competition in the quest for survival, and in the progress of human civilization. To him "mutual aid" was "the germ out of which all subsequent conceptions of justice, and ... morality" had evolved (Kropotkin, 1924, cited in Breitbart, 1981, p. 137).

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Kropotkin's concept of spontaneity in nature also included the recognition of an element of irrationality. He subscribed to the notion of "poetry in nature". He spoke about the idea and need of a poetical love of nature, and stressed that geography possessed the potential for awakening this love. In his view, the works of Humboldt and Ritter were "most liable to draw the poetical love of nature, the desire of knowing more about her mysteries, ... [and] awakening the thirst for further knowledge" (Kropotkin, 1893, cited in Galois, 1976, p. 88).

Kropotkin recognized the importance of non-purposive behaviour. He wrote that "bread alone" was not enough; art formed "an integral part of a living whole ... and the spirit and serene beauty of [artistic] creations ... produce ... beneficial effect on heart and mind". In his view, games and amusements not only performed a social function in learning, they represented an expression of the joy of life.

Kropotkin's Theory of Social Ecology

In course of developing his concept of "mutual aid" among organisms and human groups, Kropotkin laid the foundation for a radical theory of social ecology. He viewed nature and social groups as organic wholes so that the action of one part affected all the other parts. He considered social groups as being subject to many of the same processes as are found in organic nature. As such, he urged that human communities should discover the laws of nature in organisms, and act in accordance with those laws. It was not, however, his case that society should refrain from intervening in nature. All that Kropotkin meant was that human intervention should be based on a proper understanding of nature, and with due regard so as not to unsettle its balance. He believed that rather than trying to "legislate" environmental awareness into the citizenry, attention should be focused on reinforcing a sense of community and love of place. He firmly believed that rootedness in a particular environment fosters greater human interaction and a more intimate relationship with one's surroundings (Kropotkin, 1914, paraphrased in Breitbart, 1981, p. 140).

Kropotkin's Views on What Geography Ought to Be

In a paper entitled "What Geography Ought to Be?" (1885), published as part of a larger report on geographical education in Britain, Kropotkin had made a forceful plea for making the content and methodology of academic geography socially relevant. According to Kropotkin, the goal of education was to create in the citizenry a keen awareness of the diverse social (including economic and political) forces impinging upon their life, and to create in them a desire to resist political and social manipulation. According to him, owing to its potential to capture the imagination of children, geography was most eminently suited to serve this most important objective of the education of the young, and to inculcate in them mutual respect for other communities and other nations. He wrote that

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> The task of geography in early childhood [is] to interest the child in the great phenomena of nature, to awaken the desire of knowing and explaining them. Geography...must teach us that we are all brethren, whatever our nationality...Geography must be...a means of dissipating prejudice and creating other feelings more worthy of humanity It must show that each nationality brings its own precious building stone for the general development of the commonwealth, and that only small parts of each nation are interested in maintaining hatreds and jealousies (Kropotkin, 1885).

To sum up, Kropotkin had tried to revolutionize the discipline of geography in a number of key areas. "His theories of geographic education, human ecology, and decentralization were aimed at halting the use of geographical research for exploitative and imperialistic purposes. Instead of subscribing to a narrow physical view of the discipline, Kropotkin emphasized the interrelatedness of natural and social processes, and the importance to both of cooperation over competition. He also recognized that a true ecology movement had to be linked to a revival of community, and hence, radical, political, social, and economic change" (Breitbart, 1981, p. 150).

As Galois (1976, p. 91) wrote, Kropotkin offers a view of nature and potentiality of geography which could replace the post-quantitative revolution "spatial monomania" with a socially conscious account of the states and conditions on the earth. That Kropotkin's contribution to the method and philosophy of social and economic geography had remained generally neglected until recently may be explained by the fact that Kropotkin had presented these ideas during a period when the capitalist nations of the West were attempting to consolidate their power over the resources of the world. Under the prevailing imperialistic accumulation of capital through colonial exploitation through the political strategy of divide and rule, Kropotkin's voice had no listeners so that when the Royal Geographical Society of London wanted to educate its members in geography through an arranged lecture series in 1887, it looked to young Mackinder who was then a young man of 26 shaping up into a brilliant speaker and scholar, rather than to Kropotkin who had by then already made a mark as an eminent geographer, and was at hand right in the office of the Royal Geographical Society.

DEVELOPMENTS IN THE UNITED STATES

Starting with the foundation of the Johns Hopkins University in 1875, the concept of university as a community of scholars had taken root in the New World. The time had now arrived for setting paradigms for scholarly performance in each discipline by its own professionals. The pioneering work in the introduction of the new geography, then making news in Germany and France, was performed by William Morris Davis who had taken appointment as an instructor in physical geography in the department of geology at Harvard in 1878. The first separate university department in

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geography to be established in the United States was at the University of Chicago in 1903 under the charge of the geologist Rollin D. Salisbury. Geography had, however, already been present in American schools and colleges for quite some time. Arnold Guyot (1807–1884), a Swiss scholar, and former student of Ritter, had arrived in the country in 1848 on invitation from the Harvard University to deliver a series of lectures outlining the nature of "new" geography. His lectures had been brought out in book form under the title *Earth and Man: Lectures on Comparative Physical Geography in its Relation to the History of Mankind,* the following year and had remained the standard reference on Ritter's ideas for a long time. Another early pioneer in this regard was George Perkins Marsh (1801–1882) whose book entitled *Physical Geography as Modified by Human Action* had been published way back in 1864. Through this book, Marsh had introduced the American public to the ideas of Humboldt, Ritter, and Mary Somerville focusing on interconnections between man and his natural surroundings. Another important name in this regard was that of Mathew Fontaine Maury (1806–1873), a naval officer who had collected a mass of data on winds and currents of the oceans, and in 1850 had presented a model of atmospheric circulation on the earth's surface. His book entitled *Physical Geography of the Sea* (1855) was widely read.

Contribution of William Morris Davis (1850–1934)

Central to Davis's contribution to geography was the concept of "geographical cycle", as he chose to call it, though it is more popularly known as the cycle of erosion. His cycle was a generalized model of the sequence of landforms that would occur in the course of erosional work of running water on an elevated portion of the earth's surface, if there were no change in its surface in relation to elevation or sea level, and no drastic change in climate. His formula for landform evolution was based on a combined interaction between the *structure* of surface rocks, the agency of landform change (*process*) and the *stage* in the sequence of landform change already reached at a particular time. Davis claimed that his model of geographical cycle provided a theoretical framework in reference to which the observed landforms could be described and analysed:

> In the scheme of the cycle of erosion...a mental counter-part of every landform is developed in terms of its understructure, of the erosional process that has acted upon it, and the stage reached by such action... [And] the observed landform is then described not in terms of its directly visible features, but in terms of its inferred mental counterpart. The essence of the scheme is simple and easily understood; yet it is so elastic and so easily expanded or elaborated that it can provide counterparts for landforms of the most complicated structure and most involved history.

Davis belonged to the period in intellectual history when Darwin's ideas about the evolution of species were in great currency, and scholars in most fields of study were increasingly drawn to the concept of development through gradual and cumulative change over a long period of time (as part

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of the theory of evolution), and they were attempting to apply it as an underlying principle in their own researches. Davis's concept of cyclic development of landforms was clearly Darwinist in inspiration. Using the evolutionary terminology, Davis identified three stages in landform development—youth, maturity, and old age. The power of evolutionary thinking to bring diverse facts into meaningful relationships had greatly fascinated Davis, so that he wrote that

> We may in imagination picture the life of geographical area as clearly as we now witness the life of a quick growing plant.... The time is ripe for the introduction of these ideas. The spirit of evolution has been breathed by the students of the generation now mature all through their growing years, and its application in all lines of study is demanded (Davis, 1889, included in Davis, 1909, pp. 85-86).

Davis defended the concept of cycle of erosion with such vigour, and demonstrated it with such pursuasiveness, that it became almost universally accepted as a working model for landform analysis.

The key to the cyclic view in geomorphology lies in the idea of systematic, irreversible change of form through time, and it is from this that the biological concept of ageing was appropriated by Davis and his students to the study of landforms. It is important to remember here that Darwin's theory of evolution was, in reality, far from one of *evolution* interpreted as linear development through passage of time. Darwin was primarily concerned with identifying the process whereby random variations in plants and animals could be selectively preserved, and, by inheritance, lead to changes at the level of the species. Thus, what for Darwin was a *process* became for Davis and others a *history*. For many geographers like Davis, "*evolution* implied little more than the idea of change, development, and *progress* and Darwin was, in spite of himself, seen as its author" (Stoddart, 1966).

As the leading figure in American geography in his time, it was natural that Davis should be concerned with problems in geographic education and that he should state his position in regard to the nature and methodology of geography. In a paper entitled "An Inductive Study of the Content of Geography" (1906), he had clarified that the essence of his approach to geography was to seek cause-and-effect generalization "usually between some inorganic elements of the earth...acting as control, and some element of the...distribution of the earth's organic inhabitants serving as response". Causal explanatory relationship between organic and inorganic elements on the earth surface had appeared to Davis "the most definite, if not the only, unifying principle in geography". He was one of the most prominent advocates of Darwinism in human geography.

Davis was a member of the Committee of Ten appointed by the National Education Association in 1892 to review the status of geography in precollege school programmes and college entrance requirements. The report that was drafted by Davis, recommended that

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> [geography in America] should take on a more advanced form and should relate more specifically to the features of the earth surface, the agencies that produce or destroy them, the environmental conditions under which these act, the physical influences by which man and the creatures of the earth are so profoundly affected.

The report was accepted by the government. Following the implementation of these recommendations school geography in the U.S.A. was transformed from pure memory work to the status of a general science. However, the Davisian legacy to geography was that, at least at the level of the American school system, teaching of geography became oriented to a restricted paradigm of cause-and-effect relationship between physical environment and human response. In other words, irrespective of changes at the level of research, geography in the U.S.A. had continued, for a long time, to be oriented to a deterministic perspective. (For fuller treatment of the Davisian "strategy" see: Livingstone, 1992, pp. 202–212.)

Contribution of Mark Jefferson (1863–1949)

Geography made rapid progress in the United States, so that in the opening years of the twentieth century, there were several geography departments across the country offering university courses under faculties comprising senior geographers. As the community of geographers grew, there was far more open questioning on the nature and content of geography--questions and answers that helped give American geography a distinct identity. Many scholars had contributed in this development, but a most distinguished name was that of Mark Jefferson, a former student of Davis, who was appointed professor of geography at the Normal College in Yapsilanti in 1901, and stayed there until 1939.

As James wrote, Jefferson deserves a special place in the history of American geography not only because of the enthusiasm he enkindled in his students, but also for the many contributions to the conceptual structure of geography that came from his pen. Jefferson strongly disagreed with the recommendations of the Committee of Ten regarding the content and conceptual approach to geography. He insisted that the focus of geography teaching should be "man on the earth", in that order, not "the earth and man". Jefferson's geography (in sharp contrast to Davis's) was a man-centred geography. Further, Jefferson was opposed to the view of Davis and the Committee of Ten which had favoured the study of systematic geography to the exclusion of regional geography of other parts of the world. As a professor in a teachers' training college, Jefferson realized the role of knowledge about lands and peoples around the world in training the mind of the future citizens of a rapidly shrinking world.

Responding (in 1931) to a questionnaire in regard to the nature of geography, Jefferson stated that his view of geography was many things in one, so that it defied a short and crisp definition. To Jefferson,

> The nature of geography is the fact that there are discoverable causes of distributions and relations between distributions. We study geography

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> when we seek to discover them.... But there is an art of geography—the delineation of earth's features and inhabitants on maps—cartography, and a science of geography, which contemplates the facts delineated and seeks out the causes of the form taken by each distribution and its relationship to others (cited in Martin, 1968, pp. 319–321; reference in James, 1972, p. 369).

Contribution of Elsworth Huntington (1876–1947)

Another former student of Davis at Harvard, Huntington was a most prolific writer and an imaginative interpreter of the effects of climate on human life. Correlating the periods of drought with historical dates, he developed the hypothesis that the great migrations and invasions of the nomadic peoples of Central Asia resulting in the Mongol conquests of China and India, and invasions over eastern Europe, in the thirteenth century, could be explained by dry climatic spells leading to the drying up of the pastures that formed the backbone of nomadic economy. He presented this theory in his book entitled *The Pulse of Asia* (1907). The book was a great success in the world of scholarship, and quickly launched its author on the road to academic fame. He became established as the most knowledgeable person on the influences of climate on human history. Another book published in 1915 under the title, *Civilization and Climate,* advanced the thesis that civilizations could develop only in the stimulating climates of the temperate regions, and that the monotonous heat of the tropics had destined the people of those areas to live in relative poverty.

Huntington's books were immensely popular among historians, sociologists, and medical students (owing to his statements regarding the close relationship between health and climate), as well as geographers, but at the time that Huntington was highlighting climatic influences on civilization in a deterministic style, American geography was fast moving away from the philosophy of environmental determinism. Owing to this, Huntington's influence on American geography—its philosophy and methodology—was rather limited.

Contribution of Ellen Churchill Semple (1863–1932)

Another contemporary geographer whose name deserves special mention as a leading figure in the formative phase of American geography was Miss Ellen Churhill Semple who, after a Masters degree in history, had gone to Germany to study geography under Ratzel at the University of Leipzig in 1891-1892, and again in 1895. Ratzel's ideas made a lasting impression on her historically trained mind so that she was inspired to study American history in relation to its earth conditions. The result was the publication of her first book entitled *American History and its Geographical Conditions* in 1903. The book was an immediate success and confirmed her status as an eminent teacher of history and geography.

Semple's place in the historiography of American geography lies in that she had carried Ratzel's philosophy and methodology of geography to

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the New World, and had mesmerized a generation of American students by her persuasive writing and her enchanting literary style, backed by convincing scholarship. Through her generations of American geographers came to subscribe to the view of environmental influences in shaping man's life upon the earth. Her version of the first volume of Ratzel's *Anthropogeographie* was presented in her book entitled *Influences of Geographical Environment* (1911). The opening paragraph of the book set its tone and style:

> Man is the product of the earth's surface. This means not merely that he is a child of the earth, dust of her dust; but that the earth has mothered him, fed him, set him to task, directed his thoughts, confronted him with difficulties that have strengthened his body and sharpened his wits, given him problems of navigation or irrigation and at the same time whispered hints to solution.

Further sentences in the paragraph, and many interspersed throughout the book, emphasized that every aspect of man's life upon the earth (including his philosophy, religion, as well as physiography) mirrored the influence of the physical environment of his habitat.

Semple had described her own method of study as comparative. In the preface to her 1911 book she wrote that her method of research had been to compare typical peoples of all races and all stages of cultural development, living under similar geographic conditions. If these peoples of different ethnic stocks but similar environments manifested similar or related social, economic, or historical development, it was reasonable to infer that such similarities were due to environment and not to race.

An intrinsic failure of Semple's style and method was that she had carried the concept of earth as the controlling factor in human affairs beyond the possibility of objective verification:

> In combining the writings of all nations for examples to illustrate her principles...she failed to look carefully for examples that contradicted her principles.... People who live in pass routes, she wrote, tend to become robbers of passing travelers. Then she presented case after case of people in pass routes who rob for a living, but she did not look for people in pass routes who do not rob; nor did she seek explanation for robbers who do not live in pass routes (James, 1972, pp. 379-380).

She was, however, careful enough to emphasize that the environment does not control human actions; it influences them so that there is a tendency for people to behave in predictable ways, but there could be deviations in the exact direction taken. To this extent her man-environment thesis was probabilistic in approach.

It appears somewhat strange that Semple focused upon only the approach to human geography as presented in the first volume of Ratzel's *Anthropogeographie,* the approach that had focused on man-environment relationships from the perspective of the environment viewed as a determining factor in man's life. The second volume of the book that approached the problem from the reverse route—in terms of the role of human will

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and choice, and the part played by culture and history therefore, remained an almost unknown entity in American geography, so that Ratzel was, despite himself, treated as an old style determinist.

Foundation of Geography at Chicago

As the first full-fledged department of geography in the country, founded in 1903, the department of geography at the University of Chicago had played a major role in the development of geography as a field of higher learning in the United States. Many of its students in the first decade of the twentieth century became leaders of the profession in the post-First World War period. They included Carl Sauer, Wellingdon Jones, and Charles Colby.

Geography had made rapid strides in the United States in the first quarter of the twentieth century. Colby (1955) identified three causes for this rapid stride:

- The critical role played by the surveys of the American West in which many geographers had been involved;
- Rapid increase in the volume of America's overseas trade leading to the demand for better teaching of economic and commercial geography, and
- Rapid opening up of new natural resources (including oil) which compelled attention of educators to the need of conserving them.

The school of geography at Chicago had laid down a strong tradition of field study. In the tradition of the exploring expeditions of the West, all graduate students were expected to go out of doors to examine the character of landscapes and to identify geographical problems from direct observation (James, 1972, p. 390).

Developments since the First World War to the 1950s

After the establishment of the department of geography at Chicago, university-level geography had spread rapidly across the United States. Before long, there were professors incharge of geography teaching at several universities and teachers' training colleges. This led to a great deal of independent questioning on the nature, methodology, and purpose of geography as a scientific enterprise. Many like Jefferson had been bold enough to question the concept of Davis and the Committee of Ten as early as 1909. As Harlan H. Barrows noted in his famous address to the Association of American Geographers in 1922:

> ...scarcely was physical geography established...before an insistent demand arose that it be "humanized". This demand met with prompt response and the centre of gravity...shifted from the extreme physical side toward the human side, until geographers in increasing numbers [began to define their subject as the study of] mutual relations between man and his natural environment [i.e., the combined physical and biological environment] (Barrows, 1923).

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The habit of independent thinking inspired by a dedicated band of scholars now led to vigorous competition for new approaches to geographical inquiry. Two main currents of geographical thought competed for professional acceptance as the leading paradigm for geographical work. These were, first, the proposal to develop geography as human ecology, and second, to take it primarily as the study of places and regions, that is, to develop geography as chorology. That chorology won the race, of course, is history.

Chorological studies in geography were required to be much more than mere descriptions. They were expected to be both analytical and mind-widening. The search for methodology in chorology had led to two somewhat parallel approaches. One pursued the search for genetic explanation focusing on the processes of change acting through time. This laid the foundation for *historical geography*. The second approach was motivated by the search for functional explanations for association between phenomena existing together in segments of horizontal space. This led to the organizing concept known as the *functional organization of space*. The post-First World War period also witnessed a marked shift in professional emphasis from "objective" (or "pure") academic studies to studies relating to application of geographical knowledge in finding solutions to practical problems—economic, social, and political. This led to the movement toward *applied geography*, i.e., geography in the service of society.

Geography as Human Ecology: The Contribution of Harlan H. Barrows

In American geography, the concept of geography as human ecology was set forth in clear terms for the first time by Harlan Barrows (1877–1960) in his 1922 presidential address to the Association of American Geographers (published in the *Annals*, A.A.G. in 1923). Like Jefferson and others before him, Barrows underlined that man's adaptation to the conditions of his habitat is not caused by the physical environment. On the contrary, this adaptation was a function of human choice—the central idea behind the concept of possibilism, then so much in currency in France. Barrows had expressed the view that although much of the subject matter of geography had been lost to the systematic disciplines, the content of geographical study was still far too broad for its development as a coherent discipline. He, therefore, proposed that the specialized branches of geography, such as geomorphology, climatology, and biogeography should be abandoned, and geographers should concentrate upon human ecology as the unifying theme—the central organizing principle—for their work.

Barrows was of the view that "those relationships between man and the earth which result from his effort to get a living [are] in general the most direct and intimate", and that most other human adjustments on the earth's surface are guided by these economic relations. Accordingly, he recommended that "development of economic regional geography should be promoted assiduously, and that upon economic geography for the most part, other divisions of the subject must be based". He emphasized the

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need for intensive field work and regarded "a thoroughly effective technique of field work as our greatest immediate need", since, in his view, the field represented the geographers' laboratory.

Geography as Chorology: The Contribution of Carl Sauer (1889–1975)

The concept of geography as a chorological science had a long history of development in Germany and the other countries of Europe. In America, however, geography had remained confined to the search for geographic influences in human development. By the beginning of the 1920s, many among the younger generation of geographers had started questioning the validity of the content and method of geography as a discipline built around the basic theme of man-environment relationships. The new generation of students was anxiously looking for an alternative model for geographical work to replace the existing one which they were finding increasingly unsatisfying. It was at this juncture in the history of American geography that Carl Sauer (1889–1975), who had then taken charge of a new department of geography at the University of California at Berkeley, published his frequently cited essay entitled "The Morphology of Landscape" (1925). Sauer was critical of the concept of geography built around the theme of man-land relationships, and underlined the intellectual strait-jacketing that adherence to this concept as the guiding principle of geographical work had created, since the concept tied the student to a single dogma that committed him to a particular outcome of investigation in advance. The guiding premise was that the environment influenced man, and that in course of man's life upon the earth the environment itself experienced changes.

Sauer proposed an alternative model for geography based on the works of Humboldt and Hettner. Following the teachings of the two eminent German geographers, Sauer defined geography as the study of things associated in area on the earth's surface, and the differences in the nature of areal aggregations from place to place in regard to both physical as well as cultural factors. In particular, he drew attention to the role played by human action in modifying the physical and biotic features in particular segments of the earth's surface so that natural landscapes had got slowly transformed into cultural landscapes (Hooson, 1981).

Sauer's concept of landscape included: "...the features of the natural area, and...the forms superimposed on the physical landscape by the activities of man...[who] is the latest agent in fashioning the landscape". The purpose of geography as chorology was defined as the study of "the development of the cultural landscape out of the natural landscape". Sauer himself regarded this view of geography as "the newer orientation that continues the traditional position" (Sauer, 1927, pp. 186-187).

Thus, for Sauer, geography was the study of areas, but not as description of areas as unique occurrences. The purpose of the study was to identify the regularities and occurrences from place to place with a view to formulating generalizations. According to Sauer, in order to appreciate the

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nature of the modifications brought about by human action to the original landscape of any area, to establish the nature of the processes involved, it was necessary to go back far enough in time. Morphology of landscape required a historical perspective. Thus, the concept of chorology in the study of cultural landscape promoted by Sauer differed from the concept of chorology advocated by Hettner (and later Hartshorne) in that Sauer's concept was not ahistorical or anti-historical in spirit and design. On the contrary, a keen historical insight was viewed as an essential part of the methodology pursued by Sauer and his students.

In a review of Sauer's geography, written for the Commission on College Geography, Norton Ginsburg noted that Sauer's geography was a "scientific" geography that was "concerned with regions as systems, and with the comparative method as a device for developing hypotheses concerning areal relations and processes". The major tenets of Sauer's chorological perspective in the study of landscape morphology were summarized by Ginsburg as follows:

- Geography is a comparative study of regions
- Description is an essential part of geography, and is coequal in importance with interpretation
- Focus of geography is not on human activities *per se*, but on material features of the landscape resulting from man's activities
- Features of the natural environment play a dual role in geography in that they furnish a set of structures that give character to areas, and they are one of the several factors which may help to explain the forms, patterns, and functions resulting from human occupation and use of the original natural landscape
- Cultural forms and patterns which are explainable in terms of natural features have no higher geographic quality than those of historical antecedents, and other cultural forces and factors
- The geographer engaged in the study of morphology of a landscape must look backwards in time long enough to gain proper understanding of the areal relations and processes that give character to the present landscape.

After the publication of Sauer's "Morphology of Landscape" in 1925, it had become common for research papers in American journals to report on situations where physical features of an area were not of major importance, and cultural factors were more important in giving character to areas. In a paper entitled "Location as a Factor in Geography", Hartshorne (1927) demonstrated that location relative to the sources of raw materials, markets, power, and labour was more important than location relative to relief, drainage, soils and climate. Thus, to the likes of those who had so far been "explaining" the concentration of cotton textile factories in New England by reference to humidity and climate, the new emphasis on relative location

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(with almost no mention of the role played by the elements of the physical environment) came as a shock. Chorologists like Hartshorne were, therefore, accused of "leaving *ge* out of geography".

The real change over in American geography to chorology as the basic paradigm for geographical work came only after the publication of Hartshorne's monumental *Nature of Geography* in 1939. This book presented an authoritative account of developments in modern geography, and had soon become essential reading for graduate students in every geography department. From then on, the Hettnerian concept of geography as a chorological science became enshrined as the mainstream concept of the discipline, and it continued to be so until the late 1950s.

Development of Historical Geography

Chorology was centrally focused on the study of present-day landscapes, and following the Kantian scheme of division of knowledge on a physical basis between chronological (i.e., historical) and spatial sciences—a view to which both Hettner and Hartshorne subscribed, chorology remained indifferent to the historical perspective which, according to the current interpretation of the Kantian view, belonged to the domain of another group of sciences. However, as students started applying themselves to the study of actual landscapes, they came increasingly to realize that the "being" and the "becoming" of landscapes were intimately interrelated; so that the present-day patterns in the landscapes of particular places could not be adequately appreciated without due attention to the processes (i.e., the time sequence of events) that had contributed to bring them to their present form. This meant that in practice, the chorologist was often required to go backwards in time—to adopt a historical perspective. As a result of this realization, historical geography was soon raised to the status of an essential component of the American approach to the study of geography as chorology. The influence of Sauer in this regard was quite obvious. Needless to say, however, that the historical geography of Sauer and his contemporaries was very different in nature and orientation from the one that Ellen Semple had laid down in her enchanting *American History and its Geographic Conditions* (1903).

The two chief innovators in historical geography of the post-1925 period in the United States were Ralph H. Brown, and Carl O. Sauer. In his path-breaking study entitled *Mirror for Americans* (1943), Brown portrayed the geography of the eastern seaboard of the North American continent for the period around 1810 on the basis of statements contained in the writings of a large variety of contemporary authors. Brown's imaginative approach to re-creation of the past geography of a region, (in terms of how contemporary scholars had perceived it) had, in some ways, foreshadowed the modern orientation to environmental perception in geographical studies. In a second book entitled *Historical Geography of the United States* (1948), Brown had traced geographical changes that had taken place in the course of the country's settlement by European emigrants.

The other major influence in the development of historical geography

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was Carl Sauer himself. He, and a large number of his graduate students at Berkeley, produced a number of studies of past landscapes. A major principle that emerged from these studies, focused upon sequences of the settlement process in particular areas, was that "the same physical conditions of land could have quite different meanings for people with different attitudes toward their environment, different objectives in making use of it, and different levels of technological skills" (James, 1972, p. 407). For example, in agricultural areas slope had one meaning for the man with a hoe and quite another for the man with a tractor-drawn plough. Likewise, people with one kind of culture might concentrate their settlements on flattish uplands, whereas another group belonging to a different cultural tradition might concentrate its dwellings in the valleys.

Derwent Whittlesey was another major contributor to historical studies in geography. In a note published in the *Annals*, of the Association of American Geographers in 1927, he described studies focused upon the processes of change in the settlement of an area as studies of *sequent occupance*. According to Whittlesey,

> each generation of human occupance is linked to its forebear and to its offspring, and each exhibits an individuality expressive of mutations of some elements of its natural and cultural characteristics. Moreover, the life history of each discloses the inevitability of the transformation from stage to stage.

Clearly enough, sequent occupance represented the antithesis of the concept of environmental determinism. In the opinion of Preston James, the sequent occupance studies represented a kind of *cultural determinism* in that they had started with the premise that with every significant change in attitudes, objectives, and technical skills of the inhabitants of an area, the resource base of the region is put to fresh appraisal.

Development of Applied Geography

As large numbers of trained geographers poured out from the new university departments, it was natural that their young enquiring minds should question the practical utility of their knowledge in society's efforts to improve the quality of life. On this score, they found their discipline to be severely wanting. They noted that field studies in small areas carried out by students as part of the requirement for a formal degree were of little practical utility. They expressed themselves in favour of reorienting geographical education in a manner that would make it more relevant to the resolution of overriding social, economic and political problems of the day. In response to this rising demand, a large number of studies of an applied nature carried out with a view to providing valuable inputs in planning and remedial action were taken up and their results published. Thus, geography took on an applied perspective. As a result geographers now began to find employment as consultants in both public as well as private sectors.

The breakthrough in the use of geography professionals in the study

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of practical problems had come as a result of the First World War in the course of which geographers had rubbed shoulders with other specialists to find solutions to real-life problems. In the decades following the First World War, all through the 1920s and 1930s different kinds of applied research were undertaken. In the Second World War, a large number of geographers had taken up appointments in the army and civilian departments, and there was growing appreciation of their contribution. The trend had continued.

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Developments in Geography Since World War II: From Areal to Spatial Analysis

SOURCES OF DISSATISFACTION WITH REGIONAL GEOGRAPHY

In a mid-century review of the status and content of geography, Freeman (1961) had noted that dissatisfaction with the work of regional geographers of the chorological pursuasion had, by that time, led many to wonder whether the regional approach could ever be academically satisfying. The result was that the new generation of geographers began to be increasingly drawn to systematic studies. Answering the question: Why was regional geography so dissatisfying? Freeman (pp. 142-143) gave three reasons: In the first place, he observed, much of regional study in geography was "naive", especially that carried out at the macro scale. At this scale, a good number of studies were based on the concept of natural regions put forward by Herbertson. To be sure, the concept had proved a useful pedagogic device at the time it had been proposed, but at the mid-century it could hardly stand scientific scrutiny. Secondly, many of the works in the regional stream appeared to "drag wearily through a sequence of apparently unrelated facts", both physical and human, paying "little attention to the relationship between the physical environment and the inhabitants and in some cases, they included the most involved digressions into such matters as the physical history of an area". As Freeman saw it, the trouble with regional geography was that many of its practitioners had "tried to include too much". A third, and more subtle, difficulty was that the marked success of the *pays* treatment in the Paris basin had led many students to the false belief that the whole of the earth's surface could be divided into clearly identifiable regions, each endowed with "a quality of uniqueness", with a personality of its own, so that regional geography completely neglected theory and generalization—it neglected to look for the general in the particular—a trait common to all fields of scientific learning. As Freeman wrote,

> It is, of course, true that there may be marked differences in the agriculture and standard of living between adjacent regions, but...there are other aspects of human personality expressed in art, drama, sport, religion,

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> that may override differences in economic standards clearly related to the physical environment.... Perhaps the most dangerous word in regional geography is "natural". It has so often been applied in a supposedly scientific sense to provide a world framework into which men and their activities must somehow be fitted.

The view that the enshrining of regional work as the core of geographical science had led to neglect of the systematic perspective had been projected most forcefully in a paper by Edward Ackerman in 1945. The paper was based on Ackerman's experience of teamwork with experts drawn from other social sciences for the US intelligence services during the Second World War. The demand of the teamwork revealed shocking weaknesses of geographers in the systematic aspects of their discipline so that when they were called upon to provide intelligence material for the army, their contribution was extremely thin in content. Ackerman emphasized that geographers needed to be much more firmly grounded in their topical specializations, since this alone could save geographical work from superficiality, and contribute to making its content rich. Ackerman made it clear that his call for greater attention to systematic aspects of geography in no way implied shifting the emphasis away from regional synthesis. His contention was that improved understanding of the systematic aspects of the phenomena studied by geographers would lead to greater depth in the geographers' interpretation of areal organization in particular places and territories. Ackerman's paper represented, in many ways, the conscience of his generation. He had given voice to what was being generally felt by the profession at large at that time. This is most evident from the cooperative venture of American geographers at mid-century stock taking of the status and content of geography in America. The result was published in 1954 under the title *American Geography: Inventory and Prospect,* which included wide-ranging reviews of all the important systematic branches of geography (James and Jones, 1954).

In the development of systematic perspective, Ackerman saw a remedy for the geographers' extreme isolation from other sciences—physical and social. In a forceful paper published in 1963 he pointed out that the dominant concept of geography as "areal differentiation" derived from Hettner "favoured (although it did not demand logically) a goal of investigation independent of the goal of other sciences. The same might be said of another important concept in the field, that of areal functional organization, introduced by Platt (1959)". He lamented that "In our search for a solid footing...many of us tried to separate ourselves from the other sciences... and some of us saw geography as an end in itself rather than in the broader context as a contributor to a larger scientific goal". By around 1950, there was a strong and widespread feeling in the United States that geography needed to break out from its professional isolation to which the Hettnerian concept of geography as chorology had contributed to lead us.

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THE SCHAEFER-HARTSHORNE DEBATE: FROM REGIONAL EXCEPTIONALISM TO GENERALIZATION AND THEORY

This pent up feeling of disappointment with the state of affairs in contemporary geography had found voice in a forceful paper by Schaefer (1953), an economist turned geographer, then teaching at the University of Iowa. This posthumously published paper (Schaefer had passed away while the paper was still in the press) was aptly entitled "Exceptionalism in Geography". It became a rallying point for the large crop of young geographers who were feeling greatly dissatisfied with the "sterile" regional paradigm of geography as chorology. Schaefer criticized the "exceptionalist" claims made for regional geography, and put forward a strong case for geography to adopt the philosophy and methodology of scientific positivism. Debunking the contention that geography could not adopt a systematic perspective owing to the restriction imposed by the uniqueness of places and regions, Schaefer wrote that most sciences, including physics and economics deal with unique phenomena and geography could claim no special status on that account. All sciences study unique events which they seek to explain in terms of general laws. This should equally apply to geography. He made a strong case for geographers to focus attention on the formulation of laws governing spatial distribution of phenomena on the earth surface since it is *spatial arrangement of phenomena, and not the phenomena themselves* that are the special concern of geography as a science. He defined geography as the science of spatial arrangements, and underlined the essential difference between the nature of laws developed in geography vis-a-vis the laws of the other social sciences. Geographical laws are pattern laws, as contrasted to the process laws of the other social science disciplines. Schaefer advocated the need for effective channels of academic communication with other social science disciplines, and to interact with them more freely than had been the case in the past. He firmly believed that a full understanding of the assemblage of phenomena in particular places described by the geographer cannot come without due understanding of the process laws governing their functions. Thus, like Ackerman, Schaefer too was a strong advocate of interdisciplinary teamwork.

Since Schaefer's paper had posed a challenge to the concept of geography projected and popularized by Hartshorne's *Nature of Geography* (1939), it was natural that Hartshorne should offer a rebuttal in the form of a well-argued response. The first reaction from him came in the form of a letter to the editor of the *Annals*, A.A.G. (1954), in which the original paper of Schaefer had been published. This was followed by two full-length papers in the same journal in 1955 and 1958, and finally by his monograph entitled *Perspectives on the Nature of Geography* (1959). Hartshorne used this monograph to present a wide-ranging review on the nature of the subject, including discussions on, and clarifications about, many points of criticism regarding the concept of geography as areal differentiation. The book was intended as a supplement to his *Nature of Geography*.

In his new monograph, Hartshorne stuck to the essentially chorological

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concept of geography propounded in his earlier book, and he reasserted that "Geography is a discipline that seeks to describe and interpret the variable character of the earth's surface as the world of man" (p. 47); and underlined that although time was important in the study of geography, the discipline's "primary concern" was to describe "the variable character of areas as formed by existing features in interrelationships"; that is, functional relationships between phenomena of diverse origin existing together in particular places at the present time. Accordingly, in Hartshorne's view, historical geography as the branch of geography as a professional field could focus only on the study of the *historical present,* also called "past geographies". There was, nevertheless, a perceptible shift in Hartshorne's earlier position regarding the centrality of regional synthesis in geographical work. In his chapter entitled "Is Geography Divided between Systematic and Regional Geography?", he wrote that geography cannot be divided between systematic studies which analyze individual elements over the whole world, and those which analyze complete complexes of elements by areas, since:

> The former are logically a part of the appropriate systematic sciences, the latter simply cannot be carried out. All studies in geography analyze the areal variations and connections of phenomena in integration. There is no dichotomy or dualism, but rather a gradual range along a continuum from those which analyze the most elementary complexes in areal variation over the world to those which analyze the most complex integrations in areal variation in small areas. The former we may appropriately call "topical" studies, the latter "regional" studies, provided we remember that every truly geographic study involves the use of both the topical and the regional approach (pp. 121-122).

In another chapter, "Does Geography Seek to Formulate Scientific Laws or to Describe Individual Cases?", Hartshorne emphasized that the primary objective of science is to extend the frontier of knowledge and to understand reality. "One of the most important methods of accomplishing this purpose...is the construction and application of scientific laws. But to assert, as some do, that the formulation of scientific laws is the end-purpose of science is to confuse the means with the end" (p. 168). The focus on the essential task of geography as the study of complex integrations in unique places, meant (in Hartshorne's view) that geography, by virtue of the nature of its subject matter, must remain restricted to description and explanation of individual cases, i.e., particular areal complexes. In this context, Hartshorne (1959, pp. 169-170) highlighted the essential nature of geography as a science in the following words:

> Geography seeks (1) on the basis of empirical observation as independent as possible of the person of the observer, to describe phenomena with the maximum degree of accuracy and certainty; (2) on this basis, to classify phenomena, as far as reality permits, in terms of generic concepts or universals; (3) through rational consideration of the facts thus secured and classified, and by logical process of analysis and synthesis, including the construction and use wherever possible of general principles or laws of

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> generic relationships, to attain the maximum comprehension of the specific relationships of phenomena; and (4) to arrange these findings in orderly systems so that what is known leads directly to the margin of the unknown.

Hartshorne emphasized that geography is a field the subject matter of which includes the greatest complexity of phenomena, and at the same time is concerned, more than most other disciplines, with the studies of individual and unique cases. "For both these reasons geography is less able than many other fields to develop and use scientific laws, but nonetheless, like every other field, it is concerned to develop them as much as possible" (Hartshorne, 1959, p. 170).

The essential difference in the positions taken by Hartshorne and Schaefer was that: "Hartshorne's was a positive view of geography: Geography is what geographers have made it. Schaefer's view on the other hand, was a normative one, what geography should be, irrespective of what it had been" (Johnston, 1983, p. 57). The fact, however, was that since Hartshorne's position was fast losing ground, geographers in increasing numbers had, by the end of 1950s, veered round to Schaefer's view of geography as a spatial science. For this, they used methods of the other systematic sciences and were increasingly concerned with quantification and development of theory, so that by the time Hartshorne's *Perspective* had appeared in 1959, the quantitative revolution had reached its zenith (Burton, 1963).

As many scholars have noted, the contrast in the postures adopted by Schaefer and Hartshorne was more apparent than real. In his 1955 paper Hartshorne had, indeed spoken of an "essential agreement" between himself and Schaefer. As Gregory (1978) wrote, "It is certainly hard to see how Hartshorne's simple correlations differ from Schaefer's morphological laws, given that they can both be reduced to spatial patterns". The two differed only in the status that each ascribed to these patterns in geography as a field of scholarly study. While Schaefer regarded identification of laws about patterns of spatial relationships as the *raison d'etre* of geography, Hartshorne (1939, pp. 551 and 644) maintained that although identification of "concepts, relationships and principles that shall...apply to all parts of the world" was important, it could not be taken as the primary goal of geographic study. Such an emphasis, in Hartshorne's view, divested specific regions "of the fullness of their color and life" which according to him was the ultimate object of geographical inquiry. In a nutshell, "in principle, their disagreement was about ends and not means" (Gregory, 1978, p. 32).

Hartshorne was not opposed to the scientific method of the positivists, except in that he thought that owing to the uniqueness of areal integrations studied in geography, the method of positivist science was, in general, not applicable in geography. Schaefer, on the contrary maintained that uniqueness was a general problem of science in that every object was in detail unique but at the same time it shared some characteristics with other such objects. The problem of uniqueness was, therefore, no ground for geography to adopt an "exceptionalist" stance. As Guelke wrote:

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> In extending the idea of uniqueness to everything, Schaefer effectively removed a major logical objection to the possibility of a law-seeking geography and demonstrated that Hartshorne's view of uniqueness as a special problem was untenable for anyone who accepted the scientific model of explanation (Guelke, 1977b, also see Guelke, 1977a).

The net outcome of the Schaefer-Hartshorne debate was that geography, by the end of the 1950s at least in the United States had come increasingly to be viewed as a science requiring the use of the "scientific method" so that, like other sciences, it could also develop laws and theories relevant to its field of study. This brought about a distinct shift in emphasis from regional to systematic studies, which meant that geography thereafter began increasingly to be viewed as a field of study that required urgently to adopt a nomothetic perspective, that is, it required to develop the habit of seeking the general in the particular. This also involved a shift from *areal* to *spatial* studies; from *absolute* to *relative* locations; and from *areal integrations* to *spatial interaction*, circulation and movement (which generated the spatial patterns which geography as a spatial science sought to explain with a view to identifying morphological laws underlying them). Geography began now on to be increasingly viewed as a "discipline in distance" (Watson, 1955), so that the network of communication lines, and the flow of goods, people, and messages passing through them began to receive increasing attention. As the discipline dealing in distance, geography became increasingly a study of "spatial interaction" (Ullman), since it is these interactions that created the spatial patterns that new geography as spatial science sought to explain.

Thus, the new orientation in geography toward search for theory and morphological laws became increasingly focused on the study of spatial patterns of diverse kinds. Patterns in space represented essentially geometrical forms of different kinds, so that the study of geometries of space became the central theme of the law-seeking new geography of the 1950s and 1960s. For this reason, for quite some time, geography became dominated by the language and method of geometry. Geographers were increasingly drawn toward the development of theories that could explain and predict patterns of spatial interaction and the resultant spatial forms.

THE COURSE OF DEVELOPMENT OF GEOGRAPHY AS A SCIENCE OF SPATIAL ANALYSIS

The movement towards new geography as the science of spatial analysis with a well-defined theoretical focus had started, to begin with, in a few selected centres in the United States around the middle of the 1950s, and from there it quickly spread to other centres in and outside the United States. These major centres of development were:

- The University of Iowa (to which Schaefer had belonged, although the leader of the school was Harold McCarty);
- The University of Wisconsin at Madison (where John Weaver's Ph.D. thesis submitted way back in 1943 had been one of the early

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examples of the application of quantitative techniques in geography. The work related to this thesis became the basis of a widely used statistical procedure for defining agricultural regions developed by Weaver in 1954). Most of the advance came only later under the leadership of A.H. Robinson who, in collaboration with Bryson (a colleague in the department of meteorology), focused attention on the development of statistical methods in cartography.

- The University of Washington at Seattle became, under the leadership of W.L. Garrison, the most important centre for the development of theoretically oriented geography, using the method of science and mathematics in the study of problems in urban and economic geography. The central place theory became a major focus of work at this centre. Edward Ullman (1980) was an important member of the University of Washington team of new geography as the science of spatial interaction. The department also benefited from the visits of the Swedish theoretical geographer Hagerstrand (a leader in the development of methods for the study and prediction of spatial patterns and processes). Several of the leaders of the new geography in 1960s (including Berry, Bunge, Dacey, Marble, Morrill and Tobler) were students of Garrison at Seattle.
- A fourth important influence in the development of quantitatively-oriented theoretical geography of the 1950s was the astronomer J.Q. Stewart of the University of Princeton, who drew attention to regularities in the distribution of various aspects of population dynamics that seemed to follow laws similar to those of physics. His interest in identifying law-like behaviour in the themes studied by social scientists had led him to develop a new field of study that he named *social physics,* which was based on the premise that "dimensions of society are analogous to the physical dimensions and include numbers of people, distance, and time". Social physics dealt with observations, processes and relations in terms of these three variables. According to Stewart, "the distinction between social physics and sociology is the avoidance of subjective description in the former" (Stewart, 1956). Stewart's ideas were first introduced in geography in 1947 in a paper published in the *Geographical Review* and subsequently in another paper in 1956. Later, he collaborated with the geographer William Warntz (Stewart and Warntz, 1958, 1959). The latter wrote extensively on this subject. His best known work was *Toward a Geography of Price* (1959).

The work carried out under the social physics tradition contrasted markedly with the work of the other three groups noted above in that:

> Stewart and Warntz...conformed more than any others to Bunge's call for scientific approach which aimed at a high level of generality Second, there was the nature of the approach to theory, for macrogeography [of Stewart and Warntz] was inductive in its search of regularity rather

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> than testing deductive hypotheses. Finally, the analogies sought for human geography were in a natural science—physics—and not in the other social sciences (Johnston, 1983, p. 68).

Outside the United States a major centre of quantitative-theoretical geography had developed at the University of Lund in Sweden under the leadership of Hagerstrand. The first beginnings in theoretical geography at Lund had been made under Edgar Kant, an Estonian geographer who had taken refuge at Lund after the Second World War (Buttimer, 1983). He was the first to introduce the work of Christaller and Losch into Swedish geography. He had tested these theories in the course of his field research in Estonia. Hagerstrand, who later became one of the most luminous stars of the theoretical geography firmament, had served as a research assistant to Kant during 1945-1946—a contact that proved most rewarding since at that time Hagerstrand was himself engaged in research on the processes of migration. Later, under the association of the Swedish ethnologist Sigfrid Stevanson, Hagerstrand had shifted attention to the study of the processes of innovation diffusion with the aid of mathematical and statistical methods that were then just coming into vogue. His doctoral dissertation submitted in 1953 (later translated as *Innovation Diffusion as a Spatial Process* by Pred in 1968) had examined the spread of certain innovations (agricultural and others) in a part of central Sweden. Hagerstrand's focus on *process* marked a significant break with the regional tradition. It also marked a clear beginning towards a theoretical geography concerned with formulation of nomothetic concepts. He wrote that although his own research had concerned a small area in a part of Sweden, it should be viewed as a building block for further researches on diffusion processes in order to arrive at more general theories (Hagerstrand, 1953/1968, p. 1).

Under Haggerstrand's inspiring leadership, his department at Lund soon became a premier centre in theoretical-mathematical geography. Hagerstrand interacted with workers engaged in similar type of work at the university of Washington at Seattle where he was a visiting lecturer in 1959. Richard Morrill had studied under him at Lund, and his dissertation on migration and growth of urban settlements was presented there (Morrill, 1965). Bunge's path-breaking *Theoretical Geography* (1962) was published as a monograph under the Lund Studies in Geography series. During the 1960s, Hagerstrand developed his model of "time-space geography" focusing on space-time patterns and the processes which result when individuals are seen to draw upon space and time as resources essential to the realization of particular projects that compete with each other for the limited resources of time and space. (For a review of space-time geography, *see* Carlstein, Parkes, and Thrift, 1978.)

Whereas new geography as the science of spatial analysis dominated by a theoretic-quantitative perspective had become an universally accepted fact in North American universities by the end of 1950s (so that writing in 1963, Burton had declared that the quantitative revolution in geography was over), outside the U.S.A., Canada, and Sweden, the revolution was hardly visible as a wave. The first textbook on statistical methods for the

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use of undergraduates that had appeared in Britain in 1963 (Gregory, 1963), was more in the nature of an isolated event, than part of any general movement toward making geography a positivist science. A focused emphasis in this direction was first started at the University of Cambridge under the joint leadership of Chorley (a geomorphologist who had received training in the United States) and Haggett (a human geographer who also had spent some time in the United States and had experienced firsthand the new spirit in American geography). The joint effort of the two had resulted in two highly influential books: *Frontiers in Geographical Teaching* (1965) and *Models in Geography* (1967).

The first book was based on a course of lectures given at Cambridge in 1963 with a view to informing geography teachers about the "recent developments and advances" in the subject. Several of its chapters were written on a tacit "recognition of the need for a complete and radical reevaluation of the traditional approaches both to geography and to geographical teaching in Britain" (p. 365). Its purpose was to underline the importance of "theoretical models" in geographical teaching which, the editors lamented, had "been markedly barren of such models, partly as a result of the interest which has centred largely on the unique and special qualities of geographical phenomena" (p. 367). The editors strongly pleaded that geographers should do away with the false dichotomy between regional and systematic studies...through a fusion of the ideas of "models" and "regions". An epilogue underlined that the inertia in geographical teaching and research arose from "the failure to recognize the multivariate nature of geography", and from "the neglect of the strong geometrical tradition in geography" which (in the editors' view) had been basic to the Greek conception of the subject. The editors emphasized that "Geometry not only offers a chance of welding aspects of human and physical geography in a new working partnership, but revives the central role of cartography in relation to the two. Our solution then is to press for a reestablishment of the tripartite balance in geography by building up the neglected geometrical side of the discipline" (pp. 382-383).

Models in Geography was a logical extension of the *Frontiers* volume. Contributors to this volume had been asked by the editors "to discuss the role of model-building within their own fields of research", so that the volume presented a synthesis of the work done in geography by the adherents of the quantitative-theoretical stream. The volume was widely received in the countries of the British Commonwealth as a declaration of a crusade against old idiographic geography built around the concept of regions as unique entities; and as a declaration of faith in new geography structured around the methods and goals of positivist science. The volume served to demonstrate how scientific methods were (or could be) used in the study of systematic aspects of the discipline.

The Quantitative Revolution in Geography: The Search for Scientific Method

The shift in the focus of geographical studies during the mid-1950s and the

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early 1960s inevitably involved a major change—a revolution—in the nature of geographical work. It was clear that the new concept of geography as the science of spatial analysis of phenomena on the earth's surface with a pronounced commitment to theory, needed a new set of methodologies for explanation. In the initial stages of the changeover, however, few attempts were made at programmatic statement on how research should be conducted, even though there was a widely felt need of a handbook on quantitative models of explanation based on mathematical and statistical procedures, and these were being increasingly made use of in the new researches coming from the leading centres of quantitative-spatial geography. In his widely referred essay *Geography as a Fundamental Discipline*, Ackerman (1958) observed that if any single theme may be used to characterize the developments in contemporary geography in the 1950s,

> that theme would be one of illuminating covariant relations among earth features (p. 7).... Although the simpler forms of statistical aids have characterized geographic distribution analysis in the past, the discipline is commencing to turn to more complex statistical methods—an entirely logical development. The use of explanatory models and regression, correlation, variance and covariance may be expected to be increasingly more frequent in the field (p. 11).

Ackerman conceded that much fundamental research in geography could not be law-giving in the strict sense. It was, nevertheless, required to be concerned with a high level of generalization in order that its result could give meaning to other research efforts that may follow it. All geographical research must have a "block-building character". For this to be so, it was necessary that geographical studies became more precise and accurate and this could be most effectively accomplished by greater and more judicious use of quantitative methods, since "accurate study depends on quantification" (p. 30). Ackerman's essay was widely read and appreciated as an earnest and timely call for geography to develop a theoretical orientation through increased application of quantitative techniques of explanation, and to focus on research in the nature of building blocks that could serve as leads to further conceptual advance and theory.

In sum, the all-important instrument for bringing about the required change in perspectives in geographical work from regional-idiographic to systematic-nomothetic was *quantification*, that is, increased use of advanced mathematical and statistical techniques. Hence, the mid-1950s changeover in the philosophy and methodology of geography has been generally referred to as the *quantitative revolution*. Quantification was the key to the "radical transformation of spirit and purpose" that geography underwent in the mid-fifties to early sixties. This disciplinary transformation of geography was part of "a process shared by many other disciplines where established order had been overthrown by a rapid conversion to a mathematical approach", wrote the Canadian geographer Ian Burton (1963) in his widely referred paper that traced the course of the quantitative revolution and discussed its consequences for the discipline. The following paragraphs are based on Burton's paper.

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The movement that led to the quantitative revolution in geography was begun by physicists and mathematicians. It first transformed the physical and then the biological sciences, and by the 1950s, was strongly represented in most of the social sciences. The movement towards quantification was part of the general spread and growth of modes of scientific analysis into a world formerly dominated by a concern with the exceptional and the unique. As Burton noted, geography has long been a "following" rather than a "leading" discipline, in that the main currents of thought adopted at various stages in geography have had their origins in other fields. Thus, the mechanistic approach in the nineteenth century science found expression in a deterministic cause and effect approach to the study of man-environment relationships. There was a similar mechanistic flavour in much of the recent work of quantifiers. It was as if geography was reemerging after having lapsed into idiography which had followed the retreat from environmental determinism, but, although quantification in geography had been mechanistic in orientation, the new techniques being used were, in line with the prevailing trend in contemporary science, probabilistic. They were drawn from statistics which, in the words of Bronowski, "replaces the concept of inevitable effect by that of probable trend". As the "revolution", progressed, the use and purpose of quantification became more and more indeterministic.

The movement towards quantification in geography had already begun in the 1940s; it gained momentum following the classic statements of Ackerman and Schaefer in favour of making geography more theoretical and systematic in nature, it had reached its *culmination* between 1957–1960, and was over by 1963, the year Burton wrote the paper. He wrote:

> An *intellectual revolution is over* when accepted ideas have been overthrown or have been modified to include new ideas. An *intellectual revolution is over* when the revolutionary ideas themselves become a part of conventional wisdom. When Ackerman, Hartshorne, and Spate are in substantial agreement about something, then we are talking about the conventional wisdom.

The reference to Hartshorne here is to his 1959 statement that geographic work needed generic concepts and that it needed to determine correlation of phenomena with the maximum level of certainty. Both these purposes could be "best accomplished if the phenomena can be fully and correctly described by quantitative measurements and these can be subjected to statistical comparisons through the logic of mathematics" wrote Hartshorne (1959, p. 161). The reference to Spate was to his 1960 paper on "Quantity and Quality in Geography" in the *Annals*, A.A.G.

The incidence and growth of the quantitative revolution was greatly influenced by the three most talked about publications of that period namely the *Theory of Games and Economic Behaviour* (1944) by Von Neuman (a mathematician) and Morgenstern (an economist); the volume on *Cybernetics* (1948) by Nobert Weiner, which had underlined the necessity for crossing academic boundaries in order to arrive at really meaningful results; *Human Behaviour and the Principle of Least Effort* by Zipf (1949). A fourth significant

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influence came from the physicist J.W. Stewart (already discussed) who had published his influential paper entitled "Empirical Mathematical Rules Concerning Distribution and Equilibrium of Population" in the *Geographical Review* in 1947.

While quantification was easily adopted in the study of physical geography—geomorphology, climatology, and biogeography—considerable resistance was encountered in the field of human geography. This was not surprising, since in view of the possibilist tradition underlining the role of human choice, it was here that the revolution ran up against the notion of unpredictability of human behaviour. The resistance had, however, been slowly overcome by the end of the 1950s, since around this time it had come to be widely recognized that "A social science which recognizes random behaviour at the microcosmic level and predictable order at the macrocosmic level is a logical outgrowth of the quantitative revolution" (Burton, 1963)

The quantitative revolution was inspired by a genuine need to make geography more scientific, and theoretical in orientation. Dissatisfaction with idiographic geography of areal differentiation lay at its root; and the development of a theoretically oriented geography was its major consequence. As Burton put it:

> Theory provides the sieve through which myriads of facts are sorted, and without it facts remain a meaningless jumble. Theory provides the measure against which exceptional and unusual events can be recognized. In a world without theory, there are no exceptions; everything is unique. This is why theory is so important.

It is true that the need to develop theory preceded the quantitative revolution, but quantification had added point to the need, and it offered a technique whereby theory could be developed and improved.

Though the quantitative revolution had, in a sense, been over by the early 1960s, there had been few focused discussions on the philosophy and methods of "new" geography that could serve as a guide for the new practitioners. Bunge's 1962 monograph on *Theoretical Geography* was the first to fulfill this need. Bunge identified geometry as the mathematics of space, and hence the language of new geography as spatial science. The book remained the standard reference on the subject (and a second edition had come out in 1966, *also see*: Bunge, 1979) until a more comprehensive guide to the methods and philosophy of new geography as a positivist science was published in 1969 in the form of Harvey's *Explanation in Geography*.

ON THE NATURE OF POSITIVIST EXPLANATION

The origins of positivism go back to the nineteenth century French social philosopher Auguste Comte (1798–1857) who believed that the methods of the natural sciences could with equal profit be applied to the study of social phenomena. This implied that: natural laws can be developed in the social sciences; these laws (like the laws in the natural sciences) provide social scientists a basis for prediction; and these predictions can be used to

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manipulate causal variables with a view to bringing about desired improvements in society through social-economic planning.

Comte had put forward his ideas in the form of private lectures in his apartments at Paris. The lectures were attended among others by Humboldt, then nearly sixty. Comte's lectures were published as a book entitled *Cours de Philosophie Positive* in 1829. Comte's philosophy of positivism incorporated the following basic precepts:

- All scientific knowledge must be based on direct experience of an immediate reality, since direct observation is the surest guarantee that the knowledge acquired is scientific.
- The direct experience of reality should be complemented by *la certitude*, that is, the unity of scientific method. This implied that the different branches of knowledge were distinguished by their object of study (i.e., the subject matter) and not their method. In other words, sciences differ from one another in *what* they study rather than *how* they study.
- The concept of unity of the scientific method required *le precis*, that is, a common scientific goal of formulating testable theories. This implied that there was no place for subjective value-judgements in scientific inquiry since, being based on ethical assertions, value judgements are not products of scientific observation; and are as such, not verifiable.
- Positivist view of science incorporated the principle of *l'utile*, which meant that all scientific knowledge must serve some useful purpose—it should be utilizable; it should be a means to an end, and a tool for social engineering.
- The fifth precept was *le relative*, which meant that scientific knowledge is essentially unfinished and relative, because knowledge keeps progressing by gradual unification of theories which in turn enhance man's awareness of social laws. Greater awareness demands more comprehensive theory.

This was the original view of positivism that had dominated scientific thinking for almost a century. However, what is generally referred to as logical positivism (or logical empiricism) over the past half century, is a body of principles developed by a group of philosophers at the University of Vienna in the 1920s and 1930s. They accepted the basic scheme of Comte but codified its principles for the conduct of scientific inquiry in order that it could lead to well-founded generalizations and theories.

As a set of scientific principles, logical positivism is concerned with acquisition of knowledge in the form of general statements obtained through accepted scientific procedures of observation and analysis, that can be used in manipulating phenomena with a view to bringing about the desired results. This was the general concept of science that the positivists believed in. This concept incorporated a set of three related doctrines: *scientism*, i.e.,

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the claim that the positivist method is the only true method for obtaining knowledge; *scientific politics*, which means that positivism is the key to rational solution of all problems of society—it is the fundamental basis for social engineering; and *value-freedom*, which means that scientific judgements are objective and independent of moral or political commitments.

As a philosophy and methodology, positivism had been developed almost entirely through the efforts of natural scientists with a view to improving their own research. As such, the application of the principles of positivist thought to the social sciences had come to be regarded as the doctrine of "naturalism", which implied that there could be a natural scientific study of society. The fundamental tenets of this doctrine are:

1. All social phenomena involving human decision have a definite cause which can be identified and verified. This is known as the principle of *causation*.

2. Decision-making results from the operation of a set of behavioural laws to which individuals in society conform. This is called the principle of *behaviourism*, which means that a given stimulus under given circumstances will produce a particular response (so that behaviour can be predicted).

3. Social reality is an objective reality comprising individual behaviour and its results, which can be observed and recorded in an objective manner through the use of universally accepted scientific procedures. This is known as the principle of *realism*.

4. The scientist is a disinterested observer who can stand outside the social phenomenon he is inquiring into (even though in his day-to-day life he may be part of it). This is known as the principle of *disinterested observation*.

5. Like other organisms in nature, human society is an organic whole (having a definite structure) which changes in a determinate manner, according to certain observable laws. This is known as the principle of *functionalism*, and implies that various elements in society occupy a particular location and perform a related function within it.

6. The laws and theories of positivist social science can be used in moulding society in a desired direction either by changing the laws which operate in particular circumstances, or by changing the circumstances in which laws will operate. This is known as the doctrine of *social engineering*.

Logical Positivism and Human Geography

Though logical positivism became widely accepted as a working principle in human geography only in the 1950s, the introduction of the principles of positivist science in Anglo-American geography may be traced back to Carl Sauer's essay on the *Morphology of Landscape* (1925) wherein he had declared that "causal geography" had had its day, and that geography could then on be established as a "positive science". Sauer's morphological method "was simply a restatement of Comte's designation of *le reel* as the only appropriate domain of scientific inquiry" (Gregory, 1978, p. 29). Sauer

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wrote that "one need not seek for something beyond the phenomena; they themselves are the lore (*Lehre*)", that is, laws. Many geographers (including Hartshorne) found it difficult to accept the proposition that scientific explanation in geography should be restricted to the phenomenal level. The search for causal laws had begun to be avoided, because:

> In the minds of many geographers causality was still uncomfortably close to the discredited thesis of environmental determinism, ... Hartshorne was, therefore, anxious to present geography as a science concerned with "the functional integration of phenomena" rather than with "the *processes* of particular kinds of phenomena". This reaffirmed its commitment to the discovery of spatial associations (Gregory, 1978, p. 30).

Hartshorne described geography as a "naive science" which looked at "things as they are actually arranged and related" (Hartshorne, 1939, p. 594). This meant that although geography could operate at a non-phenomenal level, it continued to be confined to the demonstration of regularities—simple correlations—and was not to be permitted to disclose causal relations. The result was that despite its positivist mould, geography continued as an essentially idiographic (or exceptionalist) discipline.

Human geography was one of the last of the social sciences to adopt positivist approaches on a wide scale. There were several reasons for this. Geography had very weak links with the other social sciences until relatively recently; the discipline's main links to the natural sciences, through physical geography, were with geology in which positivism was not dominant; and owing to its firm base in the humanities (alongside a nonsocial scientific history) and exceptionalist philosophy, it failed to adapt the positivist methodology. Thus, although Schaefer's paper "had opened the door to the premises of logical positivism, their admission into the discipline was slow and, as it were, through several side entrances rather than up the main steps" (Gregory, 1978, p. 32).

One of the most significant innovations of logical positivism was its recognition of the basic distinction between *analytic* and *synthetic* statements. Analytic statements are defined as *a priori* propositions whose truth is guaranteed by their internal definitions (i.e., tautologies). Analytic statements constitute the domain of the "formal sciences" (logic and mathematics) which play a vital role in maintaining the coherence of the systems of *synthetic statements*, whose truth has to be established empirically through the conventional method of hypothesis testing. This innovation signified a major break with the Comtean model in that it accepted that some statements could be validated without actual experience and observation, and thereby conferred upon the deductive mode of explanation a high scientific respectability.

Though the new geography as spatial science was cast in the logical-positivist mould, much work in the discipline depended on inductive-statistical rather than deductive-mathematical methods of explanation, irrespective of the discipline's overriding concern with derivation, validation, and integration of general theorems of spatial organization. The debate over exceptionalism had given legitimacy to, and established the superiority of,

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the nomothetic perspective vis-a-vis the idiographic concept of the discipline that was pursued under chorology. The search for theory led to interdisciplinary explorations, so that a number of theories from the other social sciences (economics, psychology, and sociology)—where logical positivism had already become an accepted principle that was yielding fruitful results—were incorporated in the new theoretical formulations about spatial structures.

As Bowen (1970, 1979, 1981) noted, both Kant and Humboldt had rejected brute empiricism of Comte's positivist view of science. Still, much of the subsequent development of geography as a science had remained dominated by an undeclared acceptance of some of the Comtean assumptions. This explains why at the time that "new geography", cast into the logical-positivist mould, had appeared on the scene in the 1950s, many a discerning scholar had found it "less of a radical departure than logical extension of ideas which were already generally accepted by many geographers" (Guelke, 1978). Whereas in chorological geography, the student had to choose between a systematic (i.e., lawmaking) perspective vis-a-vis the goal of description of areal integration in particular places viewed as unique examples of their kind (i.e., idiographic-regional study), in new geography, the spatial science, theory and generalization were enshrined as the focused objective of the discipline. As Guelke wrote, Schaefer's insistence on the need for geographers to develop laws had "created a major crisis within the discipline" since in a world currently permeated by the spirit of law-seeking science, it was not surprising that most geographers opted for geography as a lawmaking (or law-seeking) science. As Harvey wrote:

> ...the student of history and geography is faced with two alternatives. He can either bury his head ostrichlike, in the sand grains of an idiographic human history, conducted over unique geographic spaces, scowl upon broad generalization, and produce a masterly descriptive thesis on what happened when, where. Or he can become a scientist and attempt, by normal procedures of scientific investigation, to verify, reject, or modify, the stimulating and exciting ideas which his predecessors presented him with (Harvey, 1967, p. 551).

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Behavioural Persuasion in Geography and the Rise of Humanistic Geography

By the mid-1960s, once the need for precision in research through increased use of statistical-mathematical techniques had been commonly accepted, and the controversy regarding systematic versus regional geography resolved (with the scale tilting in favour of the former, but both being accepted as interdependent and equally useful components of the discipline), the euphoria about quantitative "revolution" had greatly receded. The profession began to look back on the course of the revolution and assess the resultant gains and losses for the discipline. By the second half of the 1960s, many workers had begun to feel disillusioned with the models being developed (and used) by human geographers of the positivist orientation, since they failed to relate to real life situations. Deductions based on central place theory (then so much in vogue) were found to be only vaguely reflected in actual patterns of settlements in most parts of the world. This led to the general inference that the postulates on which the central place theory and other morphological laws of positivist geography were based, had provided a weak, and far from satisfactory, basis for understanding the nature of social organization of space.

The human geographic models of new geography as the science of spatial analysis were based on the concept of "economic man", and a belief in economic rationality in decision-making. With the dawning of the realization that the new models based on these two related concepts had failed to relate to real life world of day-to-day experience, geographers began to question the very assumption of economic rationality as the basis for the study of human decision-making. It must, however, be noted here that the disillusionment with new geography did not by any means question the basic goal of positivist research—the search for generalization and theory. The dissatisfaction was, mainly with the general methodology and its underlying postulates. Thus, alongside the rejection of the concept of strict operation of the principle of economic rationality (that is, the concept of profit-maximizing decision-making), there was a perceptible *shift from deductive to inductive* mode of explanation. Yet another significant development was that an increasing number of workers in new geography were now beginning to feel convinced that a deeper understanding of

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man-environment interaction could be achieved if geographers paid greater attention to the study of the mental images that the decision-makers have of the environment to which their decisions relate since it is the perceived reality that leads to action.

The realization that decisions may be based on subjective or perceived reality rather than on objective reality as it exists in nature led to attempts toward derivation of theories of spatial behaviour alternative to those that had previously been derived through the guiding principle of economic rationality; theories that would be "more concerned with why certain activities take place rather than what patterns they produce". This called upon the researcher to see "the real world from the perspective of those individuals whose decisions affect locational or distributional patterns", and try "to derive sets of empirically and theoretically sound statements about individual, small group or mass behaviours" (Golledge, Brown, and Williamson, 1972).

This shift in focus from the study of spatial patterns to the study of the societal behaviour that produced any particular set of patterns, inevitably led to a shift in the primary source of inspiration from economics to the behavioural sciences—most particularly to social psychology. As Gold (1980) noted, the behavioural pursuasion in geography represented the geographical expression of "behaviouralism" which had at that time spilled into the social sciences from the behavioural sciences. The objective of behaviouralism was to replace the simplistic and mechanistic conceptions of man-environment relationships with a new theory that views human actors in space as thinking beings whose actions are mediated by cognitive processes (that is, the mental processes by means of which people acquire, organize, and use knowledge). The focus was on studying how people come to terms with their physical and social milieux. The behaviouralists rejected the assumption that decisions are always based upon a sequence of reasoned thoughts involving systematic evaluation of all available options. The behaviouralist was concerned with the full spectrum from the subconscious impulse to the self-conscious deliberation in the process of decision-making.

BEHAVIOURAL GEOGRAPHY

The approach to man-environment relationships that many geographers adopted in the late 1960s as part of the movement toward behaviouralism in geography, had four distinguishing features: First, it started with the premise that the environmental cognitions upon which people act may differ markedly from the true nature of the real world. This implied that space possesses dual character, one as the *objective environment* (or reality as it exists in nature), and the other as a *behavioural environment* (that is, reality as it is perceived by the decision-maker). The behaviouralist geographer focused attention on the environment as perceived. Secondly, the behavioural geographers asserted that the individual shapes, as well as responds to, his physical and social environments. Such an assertion implied

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that behaviour is not just the end product of a chain of events but also the start of new sequences. Thirdly, behavioural geographers tended to focus upon the individual rather than to approach problems at the level of the social group. This was with a view to comprehending the processes involved in reaching decisions. A large number of studies focused on the behaviour of individuals could provide the raw material for inductive generalizations. Lastly, behavioural geography was "multidisciplinary" in outlook in that as a relative newcomer to behaviouralism, behavioural geography looked to the other behavioural sciences to provide insights into behavioural processes (Gold, 1980, pp. 4-5).

Beginnings of the Behavioural Movement: Decision Process in Spatial Context

Though several geographers had, from time to time, drawn attention to the role and importance of perception in the study of human behaviour, and the process of creating landscapes (e.g., Sauer, Wright, White, and Kirk), the work that proved seminal in the starting of the movement toward behaviouralism as an "alternative" to the normative approach to theory (then so much in circulation) was a paper by Julain Wolpert entitled "The Decision Process in a Spatial Context", published in the *Annals*, A.A.G. in 1964. The paper was based on his Ph.D. thesis submitted at the University of Wisconsin. It had appeared at a time when many new geographers were looking for an alternative to the normative model of geography as the science of spatial analysis built around the concept of economic rationality and profit-maximizing behaviour. The paper was built around the results of a field study of agricultural land use in a part of Sweden. The author compared the actual labour productivity of farms with what could have been achieved under optimizing decision-making by the farmers as rational economic persons, and found that there was upto 40 per cent less than the expected level of productivity. The lower than expected level of productivity was explained as a result of the farmers' lower aspiration level which was itself a reflection of their economic and social environment, the context which motivated them to act differently from the theoretical economic man. Wolpert criticized the axiom of economic man in contemporary geography, and suggested that in geographical work on economic behaviour, "Allowance must be made for man's finite abilities to perceive and store information, to compute optimal solutions, and to predict the outcome of future events, even if profit were his only goal".

The distance-reducing spatial science paradigm of the post-Second World War geography was rooted in the works of economists who wished to extend the range of economic analysis by incorporating the spatial dimension. In like manner, the basic inspiration for behavioural geography also was derived from certain contemporary developments in economics. Around 1950, many scholars in economics had begun to question the axiom of economic rationality in human behaviour. In an influential paper, Simon (1956) had seriously questioned the basic postulate of economic man as a

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rational and profit-maximizing individual. Simon asserted that decision-makers have bounded rather than perfect knowledge of their environment and as such, they operate within conditions of uncertainty. To Simon it was inevitable that owing to their bounded knowledge, the decision-maker's rationality is also bounded. As such, it was unlikely that an entrepreneur could achieve more than a satisfactory (as against optimal, profit-maximizing) outcome to a given economic problem.

Wolpert's research reported in his 1964 paper was designed to test whether decision-making in the case of his sample accorded to Simon's "satisficing" model or to the "optimizing" model of the economic rationality school. He concluded that his investigation gave support to the theory of satisficing behaviour as against the theory of economic rationality. Wolpert noted that in his sample the farmers' decisions were reached in a situation of incomplete knowledge, so that their rationality was bounded. Besides, the decision-behaviour of the farmers was found to reflect not only the available objective alternatives, but their own perception of those alternatives as well as the consequences of their possible outcomes. Also important in their decision, was the role of their system of values and their degree of aversion to taking risk.

In another paper published in 1965, Wolpert reported the result of another study on the behavioural aspects of the decision to migrate with a view to presenting a further test of the validity of the satisficing model of human behaviour. His analysis showed that the gravity model of distance-decay was not adequate in explaining actual migration flows. His own research suggested that full understanding of the migrants' decision to migrate would require consideration of the set of places of which the migrant is aware (that is, a consideration of his *action-space*), the desirability and usefulness of each place to the migrant (i.e., *place utility*), and his *motivation* and goals, and the *stage* he has reached in his life cycle. The concept of place-utility proved quite attractive so that before long a good number of studies on decision to migrate were conceptualized within the *stress-satisfaction* formulation derived from Wolpert's work (1965, 1966). The stress-satisfaction framework argued that the basis of any decision to migrate is the migrant's belief that the level of satisfaction available elsewhere is greater than what is available at the present place of residence.

Subsequently, the satisficing behaviour model was also used in the study of political decision-making, such as a decision to locate some public facility (e.g., a hospital) within a city. Such decisions were found to be frequently the outcome of some compromise between alternatives rather than optimal solutions. Thus, Wolpert (1970) concluded that

> Rather than being an optimal, a rational, or even a satisfactory locational decision produced by resolution of conflicting judgements, the decision is perhaps merely the expression of rejection of elements powerful enough to enforce their decision that another location must not be used.

He found that locational decisions are in reality

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more the product of stress responses than the end result of a dispassionate and considered selection of alternatives posited by the classical normative approaches or even Simon scheme of bounded rationality.

A further advance was made by Pred (1967, 1969) who used information availability and the varying skills with which to use it, in devising a "behavioural matrix" of locational decision-making (Fig. 6.1). In any given case, the decision-maker (say an entrepreneur) can be assigned to a position in that matrix according to the amount of knowledge he possesses, and the skills he has acquired in its use. Thus, a position near the bottom of the matrix would indicate that the entrepreneur would have a greater chance of making a good locational decision than a competitor who may be characterized by a position near the top left of the matrix. However, this matrix only indicated the probable outcome, since (it was noted) there is a possibility that an entrepreneur with very limited skill and information may arrive at a better locational solution than one who possesses greater ability and information though it is unlikely to be so most of the time.

Ability to use information
Towards optimal solution ——————————→

Towards perfect knowledge ↓

$$\begin{bmatrix} B_{11} & B_{12} & B_{13} & \cdot & \cdot & & B_{1n} \\ B_{21} & B_{22} & B_{23} & \cdot & \cdot & \cdot & B_{2n} \\ B_{31} & B_{32} & B_{33} & \cdot & & \cdot & B_{3n} \\ B_{41} & B_{42} & B_{43} & \cdot & \cdot & \cdot & B_{4n} \\ \cdot & & \cdot & & & & \cdot \\ \cdot & & \cdot & & & & \cdot \\ \cdot & \cdot & \cdot & & & & \cdot \\ B_{n1} & B_{n2} & B_{n3} & \cdot & & & B_{nn} \end{bmatrix}$$

Fig. 6.1 The behavioural matrix (after Pred, 1967, p. 25).

This attempt to incorporate probability into locational analysis (by Pred and others) was an important step toward toning down the neo-environmentalism of the spatio-economic models. Various probability-based theories were used to explain and predict locational decisions. The two most important were the *game theory* (used as a numerical means to simulate the probable strategies of various participants against uncertainties of their environment) and the *information theory*. Probability offered an opportunity to approximate the idiosyncracies and inconstancies of real-world decision-making, and fitted easily into the paradigm of quantitative geography (Gold, 1980, pp. 32-33).

Thus Wolpert's various papers 1964, 1965, 1967, 1970 on the satisficing model of decision-making behaviour had contributed to heralding the arrival of a new behavioural movement in geography. By the second half of the 1960s, a new branch of geography, termed as "behavioural geography" had begun to be identified, so that a special session on behavioural geography

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was organized at the 1968 meeting of the Association of American Geographers. The papers presented at the session were published the following year under the joint editorship of Cox and Golledge (1969). The editors described behavioural geography as a subfied of geography "united by a concern for building of geographic theory on the basis of postulates regarding human behaviour". The topics discussed in the volume related to decision-making in spatial contexts, some of which had been exemplified in the recent researches of Wolpert and his associates. So great was the excitement at the behavioural thinking in geographical work that many were led to believe that geography had experienced yet another revolution—the behavioural revolution.

Studies of Hazard Perception

Although as a definite "movement" behaviouralism in geography had started through Wolpert's papers, the history of behavioural work in geography is much older. Way back in 1945, Gilbert White had presented a Ph.D. thesis on *Human Responses to Floods*. Under White's leadership a group of workers was formed at the University of Chicago to study human reactions to flood hazards using Simon's (1956) theories of decision-making. From this group and their graduate students came a large body of research on perception of natural hazards. Though the initial work had related to river floods, before long it was extended to cover all types of natural hazards. The hallmarks of the Chicago school of natural hazard studies were a concern with policy as well as academic matters, and a view of man-environment relations that depicted cognitive processes as central to understanding adjustment strategies. White established a firm ethical standpoint in his writings, and consistently maintained an attitude of social involvement with environmental problems. For him, geography was far from a value-free subject—his was a definite step forward toward giving geography a more socially relevant orientation.

The influence of the Chicago school quickly spread to other centres. The universities of Toronto, Colorado, and Clark emerged as important centres of research on the natural hazards problem. Soon after, cross-cultural research on this theme was begun under the auspices of the Commission on Man and Environment established by the International Geographical Union (IGU). The great majority of the hazard-perception studies adopted a framework for study put forward by Burton and White (1968) which sought to:

- Assess the extent of human occupance in hazard zones
- Identify the full range of possible human adjustment to hazards
- Study how people perceive and estimate the occurrence of hazards
- Describe the process of adoption of damage-reducing adjustments in their social context
- Estimate the optimal set of adjustments in terms of anticipated social consequences.

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As Gold (1980, p. 214) noted, natural hazards research differed from other areas of research in behavioural geography in two important ways: First, it was a branch of research in which geographers occupied the dominant position; most initial research was done by geographers themselves and thus, unlike in other areas of behavioural geography, research was not dependent on derived inspiration. Secondly, natural hazard studies were unusual in that this body of research represented a coherent, integrated, policy-oriented research. One unhealthy consequence of the development of the hazard perception study paradigm essentially as a "within-geography development" was that research workers engaged on this theme were less responsive to cross-disciplinary influences. This was in sharp contrast to the multidisciplinary thrust of the rest of behavioural geography.

The initial impact of hazard perception research on the wider research enterprise in geography was rather limited. This was in part because the students of hazard perception research were operating on the boundaries between physical and human geography: In North American geography, there was a long-standing tradition of separation between physical and human geography, so that most students experienced difficulty in relating to this research exercise. There was no such difficulty in the later research on decision-making in a spatial context so that it was through the work of Wolpert and others that the satisficing model of Simon became popular in geography, leading to a definite orientation toward behaviouralism.

Study of Mental Maps

The aspect of behavioural analysis that was most enthusiastically adopted by geographers during this period was the concept of *mental map* or the *geographies of the mind*. The seminal influence in this regard came from a paper by Peter Gould (1966) wherein he had argued that since locational decisions were guided by how the decision-maker perceived the quality of his environment, it was necessary for the geographer to map out the mental image of the environment on the basis of which a decision was taken. The theme was more fully developed in Gould and White (1974). Other important publications on this theme included Downs (1970), Downs and Stea (1973, 1977), and Saarinen (1979).

Mental map studies were part of the primary paradigm of man-environment relations in which man is depicted as a thinking individual whose transactions with the environment are mediated by mental processes and cognitive representations of the external environment. Various concepts were used as surrogates for the cognitive representations underlying the work on mental maps, but the one most commonly employed was the concept of "image". In geographical circles, the concept of image was derived from the work of Kenneth Boulding (1956) who had suggested that over a period of time, individuals develop mental impressions (i.e., images) of the world through their every day contact with the environment; and it is these acquired images that guide individual and group behaviour. Images were investigated at various scales, but the dominant trend of enquiry had

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focused upon the urban environment at the meso-scale. Discussions of the links between images and behaviour was centred upon discrete areas of research interest the most prominent being issues like response to natural hazards, spatial behaviour in urban areas (such as shopping behaviour), and the role of neighbourhood preferences in intra-urban migrations. The conventional paradigm of the man-environment relationship built around the concept of image was somewhat like the one represented in Fig. 6.2.

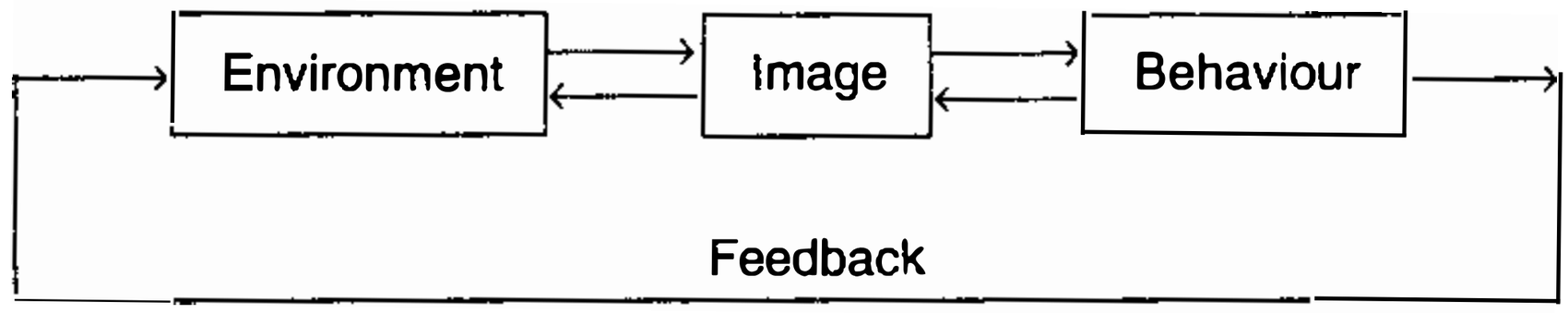

Fig. 6.2 Conventional paradigm of man-environment relationship.

This may be elaborated as a model for the study of the relationships between perception, cognitive images, values and behaviour as given in Fig. 6.3.

Behavioural geography

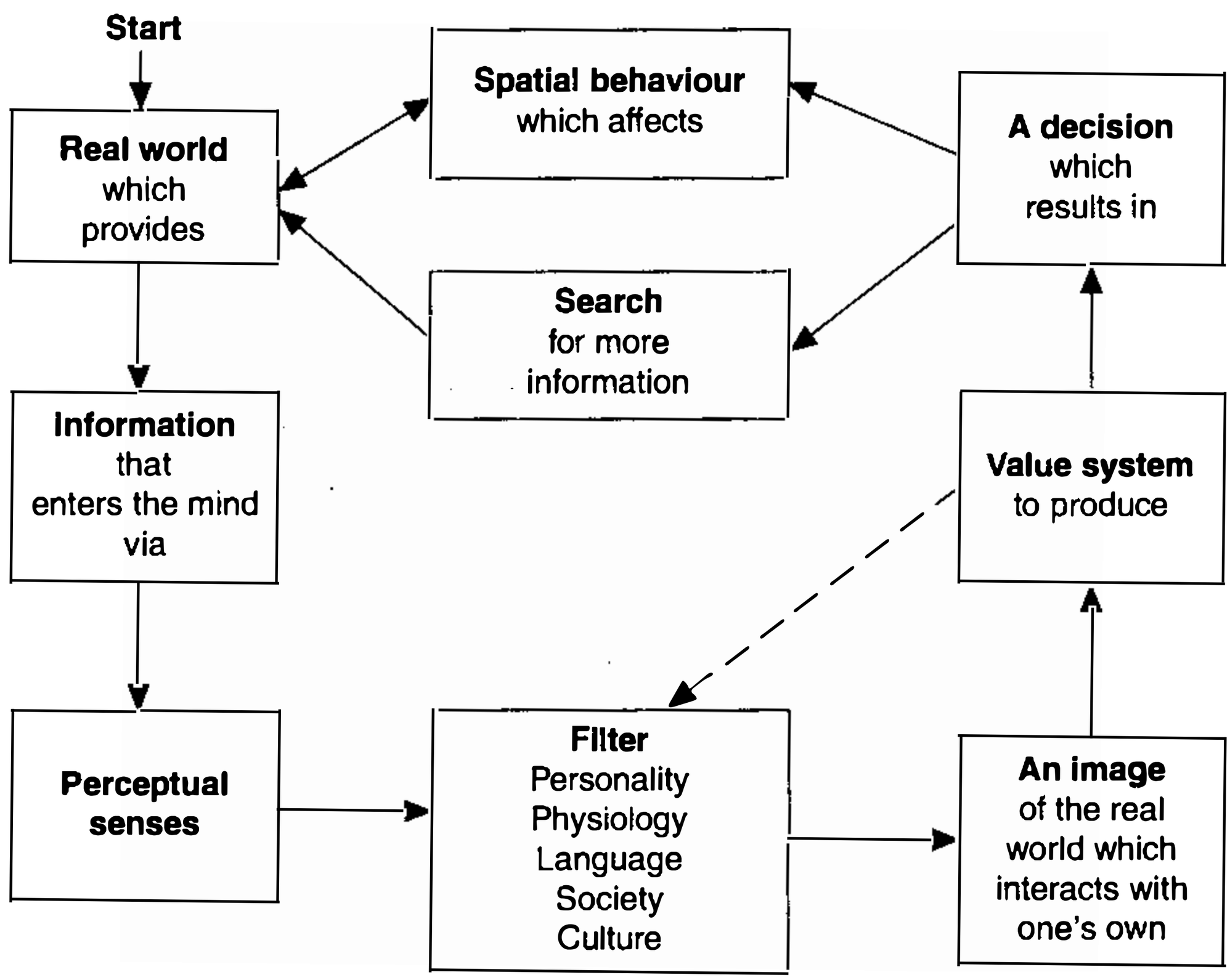

Fig. 6.3 A model for the study of the relationship between perception, cognitive images, values, and behaviour (*Source*: Fien and Slater, 1983, p. 34).

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The Contributions of Wright and Kirk

Though the behavioural movement of the post-quantitative revolution phase had been triggered by the writings of Wolpert, the attention of the profession toward the role of perception in the creation of spatial patterns and forms studied by geographers had been drawn in a focused manner by at least two geographers much before Wolpert. In his presidential address to the Association of American Geographers at the 1946 annual conference, Wright (1947) had spoken on the place of imagination in geography, wherein he had emphasized that although man had explored every area of the earth, there still lay a territory that remained almost completely unexplored—*terrae incognitae*—the territory to be found in the minds of men, the private world specific to particular individuals, but which could have features shared by others belonging to the same social, cultural or occupational group. Wright proposed a new branch of geography, which he named *geosophy*, to be devoted to the examination of geographical ideas "both true and false, of all manner of people"—that is, a field of study concerned with "subjective conceptions". Wright underlined that acquisition of geographical knowledge "is conditioned by a complex interplay of cultural and physical factors", and "nearly every activity in which man engages...is to some extent affected by the geographical knowledge at his disposal". These words could, indeed have heralded a much earlier start of behavioural geography, but apparently owing to lack of references to them in the works of later writers they failed to have any significant impact. Wright's ideas were brought to the notice of the profession in an effective manner by Lowenthal (1961) through his paper on "Geography, Experience, and Imagination" (*also see*: Lowenthal, 1975).

A more comprehensive attempt to introduce behavioural postulates in geography was made by the British geographer W.K. Kirk (1951, 1963). He had presented one of the first behavioural models to serve as an alternative to the environmentalist concepts of man-environment relationships. Kirk suggested that people act according to the way they perceive their environment, and that the environment as perceived might markedly differ from objective reality (i.e., environment as it exists). He maintained that people's perception of the environment is greatly influenced by their social and cultural values. Kirk's views were inspired by "Gestalt" psychology, so that he distinguished between the *objective* or *phenomenal* and the *behavioural environments*, and maintained that since geographers are concerned with decision-making and the consequences of decision-making, they must pay attention to the role of behavioural environment in their research.

There was, however, a significant distinction between Kirk's notion of behavioural environment and the one normally used by Gestaltists, in that Kirk regarded the behavioural environment once formed, as the basis for rational human behaviour. In this way, the real worth of Kirk's contribution lay in that he had combined two traditions, the belief in rational decision-making, and the perceptual principle of Gestalt psychology. Despite this

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combination, Kirk's conceptual frame did not appeal to the new generation indoctrinated by the positivist philosophy of the quantitative revolution. Besides, Kirk's paper was published in India (1952) and subsequently in Britain, whereas the conceptual arena of geography at the time lay in North America. Furthermore, Kirk (like White and Lowenthal) could not make any impact on the behavioural geographers of the 1960s, since they had not belonged to, what may be called, any major group or college so that none of the three were referred by Wolpert, nor did they figure in the bibliographies of Pred's (1967, 1969) reviews. There was only a passing reference to Lowenthal in the 1972 review by Golledge, Brown, and Williamson.

Themes of Research

To begin with, two types of study had dominated the behavioural work in geography. One was the analysis of overt behaviour patterns (usually travel patterns) and the other were investigations into perception of the environment. The first type of studies had adopted an inductive approach, so that recording and observation of reality were pursued as a step leading toward broader generalizations that sought to describe the behaviour patterns under study. Such researches adopted a focused emphasis on discovering the general in the particular. This research perspective differed from the approach adopted in normative model-building research of the spatial science school which began with certain sets of simplified assumptions that were used as axioms from which deductions could be made (for example, the practice of distance-minimization was deduced from the axiom of economic rationality). The element of induction was also characteristic of the perception studies focusing on mental maps and the geographies of the mind, since it was assumed that the study of the ways the representative individuals perceive their environment should prove helpful in comprehending and predicting general group behaviour.

Another distinguishing feature of behavioural research was that whereas most studies in the spatial science school were conducted either on the basis of published data sources or by means of simple field exercises in data collection, the behavioural approach demanded much greater effort in data collection about individual decision-makers. "This need to conduct social surveys of various kinds has furthered the growing links between geographers and sociologists, psychologists, and to a lesser extent, political scientists and has led to an expansion in the data-building procedures necessary for the training of geographers" (Johnston, 1983, p. 138).

As the behavioural perspective in geography became generally accepted as a useful analytical device, the scope of behavioural geography widened. Thus, a 1972 review of behavioural geography (by Golledge, Brown, and Williamson) could identify five dominant areas of behavioural research in human geography. These were:

- Studies of decision-making and choice behaviour (e.g., locational choice, route selection, and patronage patterns)

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- Analyses of information flows (in relation to innovation-diffusion)
- Models of learning (derived from theories in psychology)
- Perception research (focusing on hazard perception, image formation, and mental maps)
- Studies in voting behaviour (geography of elections).

By the early 1970s, the range of behavioural studies of man-environment interaction had become so wide that it posed problems in classification. Some researchers sought to group them according to the spatial scale of environment at which perception takes place. Downs and Meyer (1978) drew a more fundamental distinction between studies of *empirical* vis-a-vis *humanistic* orientation. While empirical studies had focused on objectively verifiable measurement and intersubjective consensus, humanistic studies relied on description and literal reconstruction with a view to revealing the self-evident meanings of the different environments. Thus, the two approaches represented, two very different paths to a behavioural emphasis in human geography, and their existence illustrates very clearly that there is no one behavioural approach to the study of man in his environment.

Beginning in the early 1960s, behavioural geography had experienced a rapid expansion, though not as rapid and wide as Burton (1963) had predicted for it. Burton had hoped that behavioural geography would soon "come to merit a place alongside the quantitative revolution in terms of significant new viewpoints". There were two main reasons why this could not happen. First, unlike quantification, behavioural geography did not accord with the *Zeitgeist* (i.e., the trend of thought and feeling) of current human geography in which the spatial aspect was being increasingly emphasized. Secondly, unlike quantitative geography, behavioural geography could not develop a coherent identity by drawing upon an integrated body of theory. This was because the student of behavioural geography had to put together many diverse strands of thought culled from several academic disciplines. Given the diversity of these disciplines, it was hardly surprising that behavioural geography had inherited, what Gold (1980) has termed as "derived diversity" of conceptual frameworks, methods, and empirical data.

Behaviouralism in Geography: Evolution or Revolution?

Through the 1960s it had been generally asserted that geography was experiencing a second revolution—the behavioural revolution—which was expected to bring about a major transformation in the discipline but experience shows that any expectations of a "revolution" were at best premature:

> Instead what has taken place has been the gradual emergence and consolidation of a set of approaches that aim to increase the scope of geographical explanation by seeking a fuller understanding of the processes that underpin real-world behaviour. Their development certainly represents

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> a significant milestone in geographical thought, but hardly constitutes the stuff which revolutions are made of (Gold, *op. cit.*, p. 1).

In a fundamental sense, behavioural approach in human geography is a point of view rather than a rigorous paradigm (Walmsley and Lewis, 1984, p. 4).

Behavioural geography did not bring about a revolution away from the spatial-science paradigm of the quantitative revolution phase, it became an attachment to it. Ontologically and epistemologically the behavioural approach did not represent any radical break from the past. Despite pretensions to the contrary, it was "business as usual":

> The changes it called for were cast in the context of current weaknesses of locational analysis and were designed to eliminate them, not through questioning philosophical presumptions but through simple incremental elaboration of existing behavioural postulates...the emergence of behavioural geography is emphatically evolutionary rather than revolutionary. It is wholly a creature of locational analysis... If locational analysis thingified social relations as spatial relations, behavioural geography ossifies them as spatial behaviour, space perceptions, cognitions and the like (Cox, 1981, p. 274).

Nevertheless, behavioural geography did represent a gradual emergence and consolidation of a set of approaches that aimed to increase the scope of geographical explanation by seeking a fuller understanding of the processes that underpin our real-world behaviour. This certainly represented "a significant milestone in geographical thought" (Gold, 1980, p. 3).

Following Gold, the major achievements of behavioural movement in geography may be listed as under:

- It asserted the role of the individual in geography which at that time had showed strong signs of wishing to reduce human activities to point patterns and spatial preferences and indifference curves.
- It led to a thorough reappraisal of the methodological approaches to man-environment relations. It countered the environmentalist and neo-environmentalist doctrines by recognizing the true complexities of human behaviour.
- It acted as a forum for new philosophies, approaches, and methods, and it revived interest in the study of some older themes, such as cultural landscape, and idiographic analysis of places.
- It opened up new channels of dialogue and debate with other disciplines, and thereby contributed to a trend toward cross-fertilization of ideas.
- Lastly, researchers in behavioural geography had contributed much to the debate on social relevance of geographical research, by helping to explode the myth of value-freedom, by promoting interest in problems of social concern, and by supporting the geographers' involvement in public policy issues.

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A major deficiency of the work in behavioural geography was that "Part of the rationale of behavioural geography is to orient more work towards policy matters, but the behavioural geographer remains the observer rather than the participant". This, according to Gold, had resulted from a serious lack of knowledge about planning theories and planning methods. In the opinion of the more radically minded geographers this appeared to have resulted from the fact that "behavioural geography, like location theory, cultural geography, and even 'socially relevant' geography, is just one more instance of bourgeois thought—of the world conceived as a totality of things interacting in external cause-and-effect relations". By ossifying social relations as spatial behaviour, behavioural geography is alleged to have "done its part" in "preserving status quo, and in obstructing more radical and revolutionary conceptions of human geography" (Cox, 1981, pp. 257 and 274).

HUMANISTIC GEOGRAPHY

As noted in the foregoing discussion, a fundamental distinction may be drawn between two types of behavioural studies pursued in the 1960s—empirical studies oriented toward deriving theories of spatial behaviour, and studies with pronouncedly humanistic orientation. The former group, focused on pursuing objectively verifiable measurement and intersubjective concensus (generalization), was identified as *behavioural geography;* and the latter group which was concerned in the main with description and literal reconstruction with a view to revealing the self-evident meaning of the environment to the decision-makers, was identified as *humanistic geography*.

Though humanistic geography shared with behavioural geography a general concern for interpreting observable behaviour in terms of what goes on in the mind, in humanistic research (unlike in behavioural) the "scientific" goals of replicable and verifiable measurement were generally discarded in favour of emphasis on understanding the world as seen through the eyes of the individual whose behaviour was under investigation. Humanistic geography, therefore, may be defined as an approach to human geography which is distinguished by the central and active role it accords to human awareness, human agency, and human creativity. Viewed thus, humanist geography is simultaneously an attempt toward "understanding meaning, value, and human significance of life events" (Buttimer, 1979), as well as "an expansive view of what the human person is and can do" (Tuan, 1976).

The conceptual difference between behavioural geography and the humanistic approach in geography is considered so fundamental in nature that some scholars have described the two perspectives—behavioural and humanistic—as "antithetical". Johnston summed this up by stating that behavioural geography treats man as a response to stimuli, so that it is concerned with identification of how different individuals respond to particular stimuli (and how the same individual responds to the same stimuli in different situations). By isolating the correlated nature of these

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varying responses, the behavioural geographers have attempted to build models and theories that can predict the probable impact of a given stimulus. The end product of behavioural research is an input to environmental planning with a view to moulding things in a desired manner. As contrasted to this, humanistic geography treats man as an individual ceaselessly interacting with his environment and, in that process, transforming both himself and his milieu. The interaction between an individual and his environment is viewed as a particular case, and not as an example of some scientifically defined model of behaviour.

> By transmitting that understanding, it seeks to reveal man to himself and to enable him to develop the interactions in ways that will be self-fulfilling. The two [humanistic and behavioural geography] cannot be combined, since the concept of behavioural laws in not in sympathy with the humanist view that men are alone responsible for their circumstances and destinies, and are free—if they so choose—to exercise that responsibility as they will (Johnston, 1983, p. 157).

The Contexts of Modern Humanistic Geography

In their attempt to explain the contexts of modern humanism in geography, Ley and Samuels (1978, pp. 1–3) had referred to the convergence of science and technology (once the harbinger of utopian society) as the central villain in the exhaustion and despoliation of man's environment. As a result of this intellectual development which perceived science as a villain (rather than benefactor), the linking of scientific rationality with politics (once regarded as the hallmark of enlightened democracy) began to be viewed as the chief mechanism through which despoliation of the environment was being perpetrated. A widespread feeling had arisen that the super-specialized sciences had succeeded in breaking man down into compartments of specialized knowledge, so that "not even all methodological weapons at their command could put him back together again." Even where they tried to do so (as in the systems theoretic framework such as that of Talcott Parsons)

> they merely reduced man further to the demands of one or another independent variable. [So that] certain pieces of fractured man were necessarily and always left out of the puzzle. To put man back together again with all the pieces in place, including a heart and even a soul... became the central goal of the twentieth century humanistic renaissance.

To begin with, the humanistic perspective was started in definite opposition to the "dehumanizing" characteristics of the methods of scientific rationality in the social sciences. Indeed, as Kant had underlined long ago, once analyzed, the logic of science demanded knowledge only of phenomena (i.e., quantitatively measurable objects) so that social science research in the positivist mould had become progressively cut off from considerations of ethics, morality, and transcendent meanings. The search for meaning and purpose in human existence was set off as the task of theologians,

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mystics, and "other none-too-reliable sorts", while science pursued the search for logical truths. Positivist social science (incorporating the liberal ideas of 18th century rationalism) was inherently humanistic in that man became the central concern in social science research, but the new methodology adopted by the social science disciplines had soon begun to "impinge on the value of being human". Man was "naturalized" (i.e., made over in the image of nature) so that social scientists got increasingly converted to the view that the social science disciplines did not require a methodology different from that of the natural sciences.

The mid-twentieth century positivism had further extended this view by insisting that the objective of scientific method was to remove all anthropomorphic elements from the understanding of anything (Max Planck, 1937, cited in Ley and Samuels, *op. cit.*, p. 7). The implication was that man must be seen as a product of his physical and social environment—that is, as a being who could be understood only in terms of his phenomenal relations.

> Questions of meaning beyond the strictures of symbolic logic, whether transcendental, teleological, or simply ethical, became a matter not for science but for arts, religion, and philosophies of the irrational. The result was a parting of the ways between explanation and wisdom, and objects and subjects; science and man went separate ways, giving rise to a fundamental distinction between the sciences and the humanities.

The mid-twentieth century humanists endeavoured

> to put man, in all his reflective capacities, back into the center of things as both a producer and a product of his world and also to augment the human experience by more intensive, hence self-conscious, reflection upon the meaning of being human.

Accordingly, principal aim of modern humanism in geography is

> the reconciliation of social science and man, to accommodate understanding and wisdom, objectivity and subjectivity, and materialism and idealism (Ley and Samuels, *op. cit.*, p. 9).

As Entrikin (1976) wrote, the contemporary version of humanistic geography began essentially as a form of criticism of the positivists' claim to objectivity, so that its main thrust was to make geographers "more self-aware and cognizant of many of the hidden assumptions and implications of their methods and research" rather than to present a coherent methodology of "post-behavioural revolution" in geography. Nevertheless, humanistic geography, as it slowly came into its own, intended to be more than just a critical philosophy:

> The intent is to reorient human geography towards a more humanistic stance, to resurrect its synthetic character, and to reemphasize the importance of studying unique events rather than the spuriously general (Johnston, 1983, p. 144).

It was an attempt to make man—the human being—the very core of

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geographic investigation; to make geography "'people geography', about real people and for the people" (Smith, 1977, p. 370). In other words, to make it as a discipline "concerned with the social organization of space rather than the spatial organization of society" (Gregory, 1981).

Approaches to Humanistic Geography

Several humanistic approaches have been advocated and canvassed for. The three most important sources of inspiration were the philosophies of idealism, phenomenology, and existentialism.

The *idealistic approach* to humanistic geography was advocated (among others) by Harris (1971) and Guelke (1971) both colleagues at the University of Toronto. Writing on the theme of theory and synthesis in human geography, Harris drew attention to essential similarities between history and geography in that both study whole complex of phenomena, many or all of which may be studied individually by other fields but are not studied elsewhere in their complex interactions. The goal of both the disciplines is synthesis. Speaking of the nature of "historical mind" Harris later wrote that such a mind is contextual, not law-finding. The historical mind, he wrote, is dubious that there are overarching laws to explain the general patterns of life. Its goal is understanding, not planning. Harris recommended that this should also be the goal of the "geographical mind". He advocated that students of history and geography should apply the idealist method, since all action is based on personal theories.

Idealism is a system of philosophy which regards reality as residing in or constituted by the mind. (This idea is called metaphysical idealism.) The philosophy of idealism limits human understanding to perception of external objects (epistemological idealism). In human geography, idealism has been interpreted as "a method by which one can rethink the thought of those whose actions one seeks to explain" (Guelke, 1974). According to Guelke, the idealistic approach in human geography seeks to "understand the development of earth's cultural landscapes by uncovering the thought that lies behind them". Thus, "the human geographer does not need theories of his own because he is concerned with the theories expressed in the actions of the individuals being investigated". To the idealist, all actions result from rational thought ensuing from a theoretical construct present at the back of the decision-maker's mind. Such theoretical constructs guiding action may be "any system of ideas that man has invented, imposed, or elicited from the raw data of sensation that make connections between phenomena of the external world". Such "theories" are part of the social-cultural milieu and include religious beliefs, myths and traditions; they represent the order which man has himself created through his social organization, so that individuals take them for granted. To the idealist, "the explanation of an action is complete when the agent's goal and theoretical understanding of his situation have been discovered" (Guelke, 1974).

The idealist is concerned with what the actor believed, not why he believed it, since according to the idealist,

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> ... all knowledge is ultimately based on an individual's objective experience of the world, and comprises mental constructs and ideas. There is no "real" world that can be known independently of the mind (Guelke, 1981).

Other humanist geographers adopted a *phenomenal approach* which seeks to clarify the social conceptions which form an essential condition of social existence. This approach, is critical of the positivist commitment to empiricism in which the possibility of cognition is so much taken for granted that no need is felt to say anything about the preconceptions on which its various objectifications necessarily depend. The positivist fails to recognize the difference between objective and behavioural environment. To the phenomenologist, all cognitive experiences possess an *intentional structure* through which objects are made to mean something specific to an individual or group.

The first to introduce the phenomenological approach in human geography was Relph (1970). To the phenomenologist there is no objective world independent of man's existence and "all knowledge proceeds from the world of experience and cannot be independent of that world" (Relph, 1970). This means that the phenomenologists describe, rather than explain: Explanation implies an observer's own construction of reality which is "antithetical to the phenomenologist's attempt to 'get back' to the meaning of the data of consciousness" (Entrikin, 1976). The student of phenomenology has no presuppositions; he does not use his own constructs in seeking to comprehend those of his subject. The subjectivity of phenomenologist research is that of the subject being studied, not of the student.

Yi-Fu Tuan (1971) was another early advocate of a phenomenological approach in humanistic geography. According to him, "humanistic geography achieves an understanding of the human world by studying people's relations with nature, their geographical behaviour as well as their feelings and ideas in regard to space and place" (Tuan, 1976). Tuan identified five major themes for research with a view to understanding how geographical activities and phenomena reveal the quality of human awareness. These are:

- The nature of geographical knowledge and its role in human survival
- The role of territory in human behaviour and creation of place identities
- The interrelationships between crowding and privacy as mediated by culture
- The role of knowledge as an influence on livelihood
- The influence of religion on human activity.

Tuan coined the term *topohila* to describe the effective bond that develops between people and place. The concept "couples sentiment with place", and is closely akin to Wright's concept of "geosophy". Topohila concentrates on the study of places as carriers of emotionally charged feelings, and as

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perceived symbols. According to Relph (1976), the concept implies "an encounter with place that is intensely personal and profoundly significant".

Closely associated with phenomenology is the philosophy of *existentialism*. Both look at the environment from an experiential perspective.

> The basic difference is that phenomenology assumes the primacy of essence—the allocation of meanings results from the existence of consciousness—whereas to the existentialists, the basic dictum is "being before essence"—or "man makes himself". The process of defining oneself (creating an essence) involves creating an environment. Thus environments can be read as biographies, as representations of man creating himself (Johnston, 1983, p. 155).

To the existentialist, "for every landscape or every existential geography there is someone who can be held accountable". This premise makes it necessary to treat landscapes as biographies. In sum, in existential terms, "human geography becomes the history of man's encounter with himself in an anthropocentric world order" (Samuels, 1978, p. 37). Since, landscapes reflect two primal needs of man—*prospect* (i.e., the need to search for means of survival), and *refuge* (i.e., the need to hide from forces that pose threats to survival)—generalizations may be possible, even though individuals and groups seek to satisfy these needs in different ways (Appleton, 1975).

Conclusion

According to Ley and Samuels (1978, pp. 11-12), there are two primary characteristics of humanistic geography. First, it is *anthropocentric*. It focuses on how, through human experience (human existence), space is transformed into place; and how "The abstract notion of spatiality is transformed into dimensions of meaning, and distance becomes the language alternatively of human relations and human alienation". The second distinguishing epistemological characteristic of humanist geography is its *holism*, that is, its tendency to see phenomena in their total context. Buttimer has drawn attention to the holistic vision of Vidal de la Blache and has pleaded that geographers today should attempt to extend the work of the great French geographer:

> The task which no other discipline with the possible exception of history, claims is to examine how diverse phenomena and forces interweave and connect with the finite horizons of particular settings. Temporality and spatiality are universal features of life so historical and geographical study belong together: Both share a quest for unity (Buttimer, 1978, pp. 72-73).

Since humanistic study in geography is concerned with either the study of individuals and their phenomenal environments, or with the analysis of landscapes as repositories of human meaning, it cannot be easily evaluated. Unlike research in the positivist mode, humanistic work has no explicit criteria by which it can be assessed, since here the purpose is not to increase explanation and predictive power but to improve understanding. For this

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reason research in humanistic geography is not cumulative so that the concept of progress does not apply.

It is relevant here to underline the distinction between behavioural geography and humanistic geography:

> Behavioural geography sees geography as one of the *social sciences*. It works, therefore, within the philosophical and methodological tradition of neopositivism (science with a human face) and seeks to enhance the social, economic and political explanation of geographical patterns by adding a consideration of the psychological factors that reflect differences in human perception and experience. Humanistic geography has advanced from the constraints imposed by scientific methods and aligns itself more with the *humanities*—those areas of study that explore the subjectivity of human responses to people, places, and events. Thus, like the historian or the novelist, the humanistic geographer seeks to provide people-oriented insights into the experiences, character and purpose of human occupation of the earth (Fien, 1983, pp. 43-44).

From such a perspective humanistic geography is viewed as the study of the earth as the dwelling place of man, emphasizing the experiential aspects of such dwelling: Thus, "dwelling" is "defined in the existentialist sense of living closely to places (ranging in scale from one's home to the entire planet), feeling comfortable and at home in them, and taking responsibility for one's actions within them.... This emphasis on dwelling leads humanistic geographers to perceive geography as a *process* rather than a body of subject content .... [Thus] Geography is something which is *lived*—[since there is] 'the geographer's "antennae" we are all born with' " (Fien, *op. cit.*). Looked thus, "Every human being who perceives, explores, experiences, and acts in space is a geographer.... Being a geographer is nothing more than the necessary workings of the human mind" (Donaldson, 1975).

THE PRACTICE OF HUMANISTIC GEOGRAPHY

Reviewing the current practice in humanistic geography, Johnston (1991) notes that much of the research in the subfield has been concerned with:

> exploring and explicating the subjectivity of human action and its base in meanings (both individual and shared), with relatively little concern for the claims of idealist, phenomenological, existentialist and other philosophies. To the extent that such work is explicitly influenced by philosophical and methodological writings, the stimulus is more often the pragmatism (and symbolic interactionism) developed by the Chicago School of Sociologists in the 1920s and 1930s... Pragmatism portrays life as a continuous process of experience, experiment and evaluation by which beliefs are continually being reconstructed; such reconstruction is a social process, whereby individuals learn and behave in the context of the beliefs of those with whom they interact.

Understanding life within this framework involves participatory fieldwork aimed at securing data lodged in the meanings ascribed to the world of active social subjects, so that this method of approach allows the truth of

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a social reality to be established in terms of its consequences for those who experience it. Participatory fieldwork helps explain how people in particular places work and interpret the world around them—that is, the reality with reference to which they function.

Other repositories of meaning for humanistic geographers include various kinds of *texts* including landscapes, and explication of meanings in "creative" or "imaginative" literature. The present day landscape represents an assemblage of relics of different periods in the past so that when we use the landscape as a text, "we are reading the outcome of a long sequence of selective retentions of earlier forms, so that we learn about what parts of their history people wanted to *build* into their own presents and futures". It is true, however, that the past does not exist independently of those who seek to interpret it. In the case of the literary text, the focus is on the novel (rather than drama and poetry which are generally ignored). The advantage of the novel lies in that it presents detailed verbal description of the contemporary condition of life including social relations, and presents graphic descriptions of places and landscapes.

To sum up, the central focus of humanistic geography work has been to describe and appreciate the variety of human experience in different places and localities while the subfield has remained relatively unconcerned with questions of philosophy so that its practice has remained overwhelmingly empirical and its search for meaning is limited to secondary sources. This has been the main reason why humanistic geography has failed to make a mark in the larger social science fraternity. But in the context of the prevailing climate in human geography in the 1960s, humanistic geography's contribution in making the discipline a man-centred or people's geography, focused on the study of social construction of place, space and landscape was no mean achievement.

In the 1980s, human geography had moved away from its earlier emphasis on positivism to take on the universalizing and place-neutral perspectives of structuralism and structural Marxism. Simultaneously, humanistic geography had moved beyond the simple idealism that tended to limit inquiry to a recovery of the intentions underpinning particular decisions in order to develop a more incisive methodology for empirical investigation that allowed for a bounded conception of human agency. Following Gregory (1994, *The Dictionary of Human Geography*, pp. 263–266) two basic streams of work can be distinguished. The first of these was characterized by interest in the recovery of the meanings behind actions, leading to the creation of particular landscapes. Such studies in the iconography of landscapes was generally associated with historical geography. Work under this stream "displayed a deep concern with particularity and specificity, rather than general theories of spatial organization, but this did not preclude the sensitive and imaginative use of theoretical constructs often (and increasingly) derived from cultural theory and historical materialism". This represented a direct input to the revival of interest in cultural geography. The second stream was more theoretical

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in orientation, drawing on a range of ideas derived from the philosophical discourses in the human and social sciences, including existentialism and phenomenology. Research inquiries were often based on ethnographic methodology and symbolic interactionism, using logical rather than statistical mode of inference and paying particular attention to questions of reflexivity. Research under this stream is closely associated with social geography. "But this stream also fed into studies in the historical geography of social struggle that were influenced by a humanist tradition within historical materialism" (Gregory, *op. cit.*). But, as Gregory has analyzed, by the end of the 1980s, the two identifiable streams had braided (intertwined) in diverse ways. With the result that (a) the theoretical sensibilities of many researchers working in the humanities were accorded far greater prominence in human geography; and (b) for those conducting a dialogue between social theory and human geography, the interest in grand theory slackened, and the claims of multiple and competing local knowledges were increasingly recognized. The outcome is that it has now become "increasingly difficult to identify a distinctively humanistic geography in the 1990s ... Many of those who had been most closely associated with the development of humanistic geography have since been drawn to postmodernism, postcolonialism and even to poststructuralism".

CONTRIBUTIONS OF HUMANISTIC GEOGRAPHY TO HUMAN GEOGRAPHY

In brief, humanistic geography examines the social construction of place, landscape, or region, as the outcome of the interplay between people and contexts which they inherit as well as help define. Such a humanistic orientation to human geography has made some important contributions to the larger discipline. The distinctive contributions of humanistic geography may, according to Ley (1989, pp. 229-230) be briefly enumerated as follows:

1. In its resistance to a pervasive reductionism and its insistence on a geography with actors, it initiated discussion of human agency, anticipating a central theme in the theoretical discourse of the 1980s.
2. Second, in its depiction of the particularity of place, landscape, and region, it established the importance of local difference or geographical contingency. This realization is now widespread...but it encountered great sceptism in the 1970s when featureless space, the isotropic plain, were the postulates of much theoretical geography.
3. A third contribution was the elimination of the fact-value dichotomy, alerting researchers to the irrevokable value-basis of their work.... It encouraged greater self-consciousness by scholars, and a self-critical attitude which readily embraced the message of critical theory of an invariable relation between knowledge and social interests.

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4. Fourth, the emphasis on values, meaning, and place has proven fertile ground for a revived view of culture and the cultural landscape. This has been an area of fruitful meeting among humanists of several stripes, including historical materialists.
5. A final contribution has been to methodology, with the adoption of a range of qualitative methods, including structured interviews and participant observation. These have accompanied a more fully interpretative style research, geographies of *thick* rather than thin description.

But, Ley was quick to point out, "if the contributions of humanistic perspective to a broader human geography are manifest, so too are its shortcomings. In part they derive from a common flaw in social science, the oversimplification of distinctiveness, an exclusive concern with the particularity of a perspective, a form of what Habermas (1983) called 'the autonomy of the segments'. In the context of humanistic geography this overstatement can lead to a treatment of subjectivity and experience as a virtual fetish, separated from context and material life".

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The Call for Social Relevance in Research: Reorientation to Political Economy

THE RISE OF THE RELEVANCE MOVEMENT

Beginning around the mid-1960s, there was a widespread resurgence of political radicalism in the United States. It was a period of mass demonstrations against government policies both at home and abroad. The previously defunct socialist parties began to be revived, and vigorous radical movements sprang up in every field. The reasons behind this changed climate of opinion were many. In the first place, this was a period of great economic uncertainty. After two decades of rapid economic growth following the Second World War, there was now a visible slump, leading to economic hardships. In this changed economic climate, people began to take stock of the successes and failures of governmental policies. There was a widespread feeling among the citizens that the general prosperity of the post-1945 period was not shared by all sections of American society. This became the primary source of grievance against government, and of inspiration for the Civil Rights Movements that had over taken almost every American city during the late 1960s. Another major cause of dissatisfaction was the American involvement in the Vietnam war, which large sections of society, particularly the youth, viewed as imperialist and anti-freedom. This was the most important factor which gave rise to widespread student protest that, starting in the United States, had by 1968, spread to several European countries. This was also the time when attention began to be focused on the problems arising from widespread despoliation of the physical environment resulting from the unrestricted growth ethic and profit maximization policy of the past decades.

These together forced a reassessment of the objectives of research in science and humanities. The condition of man and the future of his species became from then on, the primary focus of attention in natural as well as the social sciences, so that commenting upon "the post-behavioural revolution geography," Kasperson (1971) wrote: "The goals of geography are changing. The new men see the objective of geography as the same as that for medicine—to postpone death and reduce suffering". There was perceptible change in the themes of research from the earlier emphasis on the location of supermarkets and highways, to poverty and race-relations.

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In the opinion of some writers, geography was experiencing yet another revolution, described by some as "radical revolution" (Smith, 1971) and by others as "social relevance revolution" (Prince, 1971).

During the quantitative revolution phase in the 1960s, human geography research was largely focused on method (i.e., techniques) rather than on subject matter. Topics that had received special attention of research workers, such as diffusion of innovations, social ecology of cities, and multivariate regionalization, had owed their popularity as much to the availability of convenient techniques of analysis, or computer programmes, as to the intrinsic interest in the subjects themselves. Thus, "Applied human geography in regional planning and urban development was often merely an opportunity for the application of some favoured technique, which might well have been quite ill-suited to the problem at hand" (Smith, 1977, p. 4). The result was that the methodology of research in human geography had got "inverted", since the geographers ignored the basic point that theories and substantive issues should define data, and not the reverse (Slater, 1975).

Although the radical/relevance revolution, as a conspicuous shift in research direction in human geography, had occurred only toward the end of the 1960s, research on social issues had been building up throughout the decade. Problems of regional economic distress had attracted considerable attention since some of the new techniques of multivariate areal classification had begun to be applied to the measurement of "economic health", following the work of Thompson and associates (1962). The study of physical health in the form of medical geography, was gaining strength (Stamp, 1960). The use of a level-of-living index in regional delimitations was also suggested (Lewis, 1968), and an attempt was made to relate space preferences to welfare indicators (Gould, 1969).

In the year 1970, in a forceful paper entitled "The Role of Geography in the Great Transition" Zelinsky identified a most timely and momentous agenda for the human geographer as follows: "the study of the implications of a continuing growth in human numbers in the advanced countries, acceleration in their production and consumption of commodities, the misapplication of old technologies, of the feasible responses to the resultant difficulties". He made a fervent appeal that human geographers should realize the potential for immediate and unprecedented trouble contained in the current "growth syndrome" in the developed world. Zelinsky identified three different roles for geographers in meeting the impending disaster. These were:

- To involve the geographer as a diagnostician, mapping the load of population on resources (the geodemographic load), environmental pollution, crowding and stress;
- To involve the geographer as a prophet who could project and forecast the likely futures; and
- To involve the geographer in the role of an architect providing blueprints for the preferred futures, and thereby providing guidance to administrators and policy-makers.

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Zelinsky's (1970) paper gave voice to a rapidly growing concern among professional geographers at that time, which aimed at raising the conscience of the profession. This is evident from the fact that the Association of American Geographers at its 1970 annual conference organized a special session devoted to discussion on "geography and public policy", leading to the establishment of a Standing Committee on Public Policy. In 1969, a new journal representing radical thinking in geography was launched under the title of *Antipode* at the Clark University, to "ask value questions in geography, question existing institutions concerning their rates and qualities of change, and question the individual concerning his own commitments" (Editorial, *Antipode,* vol. 1, No. 1). Things were also moving in British geography. In a report on the A.A.G. conference, Smith (1971) wrote in the columns of *Area* that American geography at the time was "a melting pot", and that it was in for a big revolution. A good deal of discussion followed in the pages of the journal (Chisholm, 1971; Eyles, 1971 and 1973; Prince, 1971). Three years later in 1974, "geography and public policy" was the major focus of the Institute of British Geographers annual conference, at which delivering his Presidential address, Copock (1974) highlighted the challenges, opportunities, and implications of the geographers' involvement in public policy research.

The rise of the heightened concern for human condition, and of radical thinking in geography, in the late 1960s and the early 1970s was by no means accidental. It represented a natural reaction on the part of professional geographers to the intellectual, social and political climate of the time. Indeed, no discipline can exist in complete isolation from contemporary sociopolitical cross-currents. As Smith (1977, p. 5) wrote, just as in the United States the era of quantitative revolution was one of societal preoccupation with technological gymnastics (exemplified by outer space exploration) and with the rise of a new trend toward rational-managerial approach to human affairs, so also the late-1960s' episode of all-round radicalization reflected the social scientists' general disillusionment with the war in Vietnam, and with the apparent insensitivity of government to the various manifestations of social injustice: "Radical geography [was] the geography of the years of 'pollution crises' and of 'crisis in the cities'. It [was] also the geography of the end of the postwar era of continuous growth in the real standard of living, in which distributional issues [were] taking on a new urgency".

The radical, or the social relevance movement had taken a number of different forms, leading to the inevitable division between liberals and radicals. The former stream supported the policy of incremental change *within* "the system"; whereas the latter group of scholars held onto the view that nothing short of revolutionary socialism could create a just society out of the modern capitalist-corporate state. The social relevance movement in geography was manifested in two different sets of approaches: Among the academically oriented geographers, there was a concerted effort aimed at changing the focus of our discipline from the earlier involvement in the

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study of, what were described as eclectic irrelevancies, to the study of urgent problems of the day. Among action-oriented geographers (the activists), the dominant focus was on the search for more suitable models of organizational change. In the initial stages, however, the divide between radical and liberal thinkers was not very evident. The new geography as spatial science in the 1950s and 1960s (rooted in location theory, and economic ethic, and using quantitative techniques of analysis) had remained focused on non-vital societal issues (such as, distribution of central places) or had devoted itself to the promotion of industrial and commercial interests of the capitalist class (such as, the search for optimal [i.e., profit-maximizing] location of industries, supermarkets, and highways). However, the changed mood of the contemporary American society had begun to manifest itself in discussions at the annual conferences of the Association of American Geographers from 1967 onwards. "Radical geography represented the left-liberal wing of this movement", wrote Peet and added that in common with the followers of geography as spatial science, radical geographers also focused on only the surface manifestations of societal inequities and inequalities, for which they found the current methodologies of spatial analysis to be adequate, though not infrequently, proposals were made that the "existing methods of research must be modified ... if they are to serve the analytic and reconstructive purposes of ... radical applications" (Wisner, 1970). "The result was a geography more relevant to social issues but still tied to a philosophy of science, a set of theories, and a methodology developed *within* the existing framework of power relationships" (Peet, 1977).

The Liberal Stream of the Relevance Movement

Liberalism connotes a combination of belief in democratic capitalism alongside a strong commitment to executive action with a view to minimizing social and territorial inequalities in levels of human well-being. It represents commitment to ensure a certain minimum standard of living through state intervention to the less privileged sections of society. Such a perspective involved the geographer—in Zelinsky's scheme of things—as a diagnostician, forecaster, and an architect, who could present the blueprints for the achievement of the preferred futures.

Much of the initial work on social relevance in geography was designed to describe the existing inequalities in levels of well-being through maps, with the help of the various multivariate statistical procedures (generally identified as factorial ecologies) introduced in geographical literature on the subject by Thompson and associates (1962). Mapping of human welfare became a major theme of research in the 1970s. The concept of welfare (or level of living) was divided into three sets of variables to facilitate its measurement and mapping (Knox, 1975). These included: physical needs (nutrition, shelter and health), cultural needs (education, leisure, recreation, and security), and higher needs (that could be purchased with surplus income). Smith (1973) and Knox (1975) were the major contributors on this theme, each presenting a monograph-length study. The central premise

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behind such research was that it was the task of the geographer as a social scientist to chart out inequalities in society in a spatial context with a view to informing the decision-makers, and thereby facilitating more meaningful policy formulation. To use Chisholm's (1971) phrase, the work of Smith and Knox (and others of that ilk) represented the geographer as a delver and dovetailer. Here his task was viewed essentially as the provision of ground-level information for the use of planners and decision-makers. Combined with it was the related task of educating and informing the public—in other words, to create public awareness, since, "to be aware of the problems and their complexity may induce some sensitivity in a citizenry which has shown as yet precious little tolerance for the other point of view" (Cox, 1973). In his book entitled *Conflict, Power and Politics in the City* (1973) Cox focused attention on the current urban crisis in the United States, and offered a geographic perspective on contemporary problems in terms of conflict over access to sources of power.

In related studies Cox (1973) and Massam (1976) focused upon the theme of spatial organization of society with a view to help achieving the desired spatial pattern of the level of living. The themes under discussion included evaluation of the provision of public services in terms of the variables of distance and accessibility; redrawing of administrative boundaries to promote better administration, and location of public facilities (such as hospitals) with a view to offering more efficient service to society. A large number of studies on the welfare theme were presented. In an important textbook entitled *Human Geography: A Welfare Approach,* David Smith (1977) attempted to restructure human geography around the theme of *welfare,* which according to him, provided "an integrating focus for a more 'relevant' human geography" (Preface). In Smith's view, the welfare theme

> provides a contemporary equivalent of the regional concept, to which geographers once looked as a means of tying together their disparate subject matter. It also asks that we cross disciplinary boundaries more often, thus contributing to integration [of geography] within the social sciences at large... A welfare focus provided a centripetal force to counter centrifugal tendencies in the study of human existence (p. 363).

By focusing attention on the study of welfare, human geographers could play a unique role among the social science disciplines—

> that of helping to reveal the *spatial* malfunctioning and injustices, and contributing to the design of a spatial form of society in which people can be really free to fulfil themselves (p. 373).

Welfare geography corresponded to the general shift in societal perspectives from the narrow economic criteria of development and progress to the broader aspects of quality of life, so that distributional issues assumed great importance. This is quite natural in a period of slow economic growth since the quality of life for the general public can only be improved through a policy of redistribution by taxing the rich to provide for the deprived

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sections of society. Welfare geography addresses the question of redistribution in a spatial context, and is inevitably concerned with issues of inequity and social justice in the distribution of public goods and bads.

Thus the primary focus of welfare geography is on "who gets what where and how". Here "who" refers to the population of the area under reference in terms of its social divisions based on income and ethnic criteria, "what" refers to the goods and bads (in the form of services, commodities, and environmental quality) enjoyed (or suffered) by the population. "Where" connotes the fact that the quality of life differs according to the area of residence (e.g., the civil lines versus the outskirts and the slums). "How" refers to the social and political processes through which the observed differences arise. From this schema it is clear that the study of welfare starts with detailed description of the present state of affairs in the city or region under investigation in regard to the distributive aspects of social life by using the abstract formulations of welfare economics (which has been the main source of methodological inspiration). In order to delineate territorial inequality in the distribution of public goods and bads it is necessary to develop social indicators of such inequalities. Factors that may be taken into consideration include: income, employment, housing, health, environmental quality, education, social participation, recreation and leisure, and law and order. Studies may also focus on individual aspects of social well-being, such as inequalities in access to health-care facilities or inter-locality differences in pollutions of different kinds.

Apart from providing basic information about the quality of life in any region from which welfare planning for the future could be launched in order to provide better facilities, welfare economics is also helpful in developing suitable criteria for welfare development in a regional context. It provides the benchmark for evaluating alternative plans for development in regard to which one shall be more effective in reducing present-day inequalities in provision of social services.

Though the bulk of studies in welfare geography were primarily descriptive, as time passed description gave way to more process-oriented research focused on the study of how the observed inequalities arise. This was a by-product of the increasing popularity (and relevance) of Marxian thought. This involved explanation at two different levels, that is, understanding the operation of the social-economic-political system as an integrated phenomenon so that the general tendencies in all aspects of life are revealed, and to explain how specific elements of the economic-social-political system—for example, the differential distribution of the selected public services—benefited some people in one locality and put other people in other localities to disadvantage.

As Smith (1994a) has underlined, issues involved in the study of welfare problems extend beyond the limits of a single discipline, so that they render disciplinary boundaries increasingly irrelevant:

> The welfare approach logically requires an holistic social science perspective, including economic, social and political factors, and also

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> consideration of moral philosophy which underpins conceptions of social justice. In this rapidly changing world, where new political and economic institutional arrangements can benefit populations unequally, there is renewed interest in the issues raised by the welfare approach (Smith, 1994a, p. 676).

Another important theme of study under the revived social relevance perspective was (and continues to be), the concern for environmental problems. These included problems of environmental degradation, conservation, and management. Considerable interest was generated in the study of tourism and other recreational facilities, and the effect of such recreational activities on the quality of the local environment.

The Radical (Marxist) Stream

Owing to the absence of a Marxist tradition in American social science, the rise of a genuinely radical perspective in that country was a delayed process. This was all the more true of the discipline of human geography wherein political awareness was at a particularly low ebb, so that:

> even the call for more social relevancy was at first greeted with skepticism and hostility.... Therefore, in this conservative, self-protective little corner of science, "radical" geography took a liberal form for a time, with interest focused on bringing the discipline back into the forum of crucial events and applying geographic skills to the immediate practical problems faced by the oppressed groups (Peet, 1977, pp. 15-16).

The first conspicuous attempt to radicalize human geography research was pioneered by the American geographer William Bunge (the author of the once famous *Theoretical Geography*, 1962), who, in 1968, founded the Society for Human Exploration at Detroit, with its declared objective to induce geographers to take expeditions to the poorest and the most depressed areas with a view to obtaining unbiased firsthand information about them. It was believed that by becoming a person of the region in question, the geographer, by virtue of the experience gained, shall be able to appreciate better the kind of inputs required to improve the lot of the local residents. Such a participatory fieldwork prepares the geographer to take to *planning with* the people rather than *planning for* them. Although the methodology of research developed by the Society of Human Exploration received considerable attention from discerning intellectuals, for a variety of reasons (including the American establishment's inherent distate for socialistic ideas), Bunge's project could not materialize in its entirety, so that his lead to set a new approach to geographical work remained unfulfilled, though the Society did manage to publish a few reports on its explorations. Another related development starting around this time was that articles began to appear regularly in *Antipode*, in which the dominant focus was on the problems of the poorest and most deprived sections of society. Papers and other presentations were motivated with the view to help stop (or at least delay) plans for urban renewal, likely to cause large-scale dislocation of the

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poor, and to prevent large-size institutions from acquiring inner-city land. As Peet (1977, p. 15) wrote, these articles may be described as "the concept of expeditions writ large".

The actual breakthrough for Marxist thinking in geography came only in early 1970s. The first geographer to initiate a new beginning in this line of thought, and who succeeded in creating a new trend representing the change over from the dominantly liberal to the Marxist perspective, was David Harvey (1972), who, in a paper addressed to the problem of ghetto formation, had found the existing theories in geography to be quite inadequate for understanding the problem of ghetto formation in American cities. Harvey was convinced that the problem could be effectively attacked only at its source, that is, by eliminating the market-mechanism as the primary regulator of land-use. He pleaded that geographers should adopt a revolutionary perspective thoroughly grounded in the reality of the phenomenon that the researcher may seek to investigate. In his view, a Marxist approach to the study of social reality offered the soundest basis for critical examination of the deleterious consequences of the capitalistic system of social organization. In a critique of Harvey's paper, Folke (1972) presented a forceful case for Marxist perspective in geographical work, a perspective that offered a methodological alternative to the currently dominant liberal perspective in geography and the social sciences in general, one which was focused on "the values and interests of the ruling class." Thus,

> From 1972 onwards the emphasis of radical geography changed from an attempt to engage the discipline in socially relevant research to an attempt to construct a radical philosophical and theoretical base for a socially and politically engaged discipline. This base was increasingly found in Marxian theory (Peet, 1977, p. 17).

In this change over, Harvey's *Social Justice and the City* (1973) had played a major role. (This book emphasized the need for changeover through a number of semi-autobiographical essays. The book also represented Harvey's own conversion from liberalism to Marxism.)

Harvey rejected Kuhn's (1962), then highly popular, model of scientific development, and its central premise that progress in science is independent of the enveloping material conditions obtaining in the society in question. According to Harvey (1973, p. 125),

> the driving force behind paradigm formation in the social sciences is the desire to manipulate and control human activity in the interest of man. Immediately the question arises as to who is going to control whom, in whose interest the controlling is going to be exercised, and if the control is going to be exercised in the interest of all, who is going to take it upon himself to define that public interest?

In Harvey's view, the Marxian theory provided "the key to understanding capitalist production from the position of those *not* in control of the means of production". He maintained that through the Marxian theory

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the researcher is made aware of the roots of the present social system and the mechanism through which social inequalities are created and perpetuated; and that with the adoption of the Marxist approach to the study of social problems, the geographer can no longer remain a detached observer. Instead, he becomes politically more aware, and gets actively involved in the creation of a more just society.

From around 1974, a number of the proponents of social relevance in geographical work began to explore Marxist literature to seek guidance for conducting more socially relevant research, with the result that radical geography now became progressively more and more identified with the Marxist approach to human problems. Such a development inevitably led to the parting of the ways between the Liberals and the Radicals. The former began to be labelled by the latter as preservers of status quo (since from a Marxist critical perspective, researches conducted by the liberals tended to view societal problems as resulting from immediate causes, so that such scholars proposed ameliorative programmes of action without questioning and seeking alternatives to the underlying system that had generated and perpetuated societal inequities in the first place).

In line with the general trend in new disciplinary movements, radical geography also had initially advanced as a negative reaction to the geographical establishment of the 1960s, which had conceptualized geography as a "fragment of science specializing on spatial arrangement and man's relationship to the physical environment". According to Peet (1977, pp. 17-18), two main aspects of this relationship became the special target of criticism. These were:

> First that the relationship is with a body of science whose function is ideological protection of a social and economic system owned and controlled by a ruling minority of its members. Second, that because of this, science has fragmented and, in the particular case of geography, its relationship with the rest of science has to be made obscure. The result is a politically safe, isolated discipline which deals with only a fragment of knowledge; within this fragment, geographers try to find "causes" of the problems they observe in what is the spatial distribution of the results of far deeper social causes.

The Marxist critique, therefore, proposed, first, to make geography more obviously a part of holistic science (and thus to do away with the artificial barriers between fields of learning); and secondly, to make science (including geography) act "on behalf of the construction of a social and economic system owned and controlled by *all* the people contained within it".

As Smith wrote, few if any geographers will question the discipline's right to an independent existence. It is necessary for geographers to remember, however, that the spatial or areal perspective imbued by our disciplinary training may often impose blinkers that obscure the role and operation of "non-geographical" factors. Such a narrow "geographical" view of societal problems "risks unconsciously supporting status quo, by failing to identify root causes. Geography must stand or fall by its

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demonstrated capacity to enhance human well-being, and not by virtue of its convenience to the existing organization of society and academia" (Smith, 1977, p. 368). He voiced a word of caution to guard against the potential for familiarity with Marx growing into a fashion effect similar to the one that had accompanied the quantitative revolution in the 1960s: "Marx may have been able to dissect the operation of a capitalist economy, polity and society that we so often miss today. But Marx does not hold the key to every modern problem in complex pluralistic societies" (Smith, 1977, p. 368). Philosophical and methodological rigidity in seeking resolution of societal problems is restrictive of human initiative. Social science research must remain open to alternative perspectives which must not be condemned without giving them a try.

THE POLITICAL ECONOMY PERSPECTIVE IN HUMAN GEOGRAPHY

The term political economy was first used in its current sense in the late eighteenth and early nineteenth centuries, and was associated with the ideas of English classical economists such as Adam Smith and David Ricardo. The classical economists (particularly Ricardo) had emphasized two aspects of the interaction between society and economy which are central to the concept of political economy. These are: production and accumulation; and distribution of the *surplus* produced. The distribution of the surplus is pronouncedly a political act. Thus the questions of distributing surplus among classes of people pushed the enquiry beyond the realm of the purely economic to the sphere of the social and political. Hence the name political economy.

Marx (whose ideas dominate current political economy) integrated the issues of production and distribution into a theory of revolutionary change through the methodology of *dialectical materialism* (signifying the perpetual resolution of binary oppositions, the thesis and the antithesis, as Hegel put it). From this methodological perspective Marx argued that the problem of the classical economists was that they treated concepts such as production and distribution as if they were eternal in nature, and so failed to recognize that the forms of production and distribution are products of particular sets of historical and material circumstances. Marx insisted that we must always be aware of the historicity of our conceptual constructions, and be willing to challenge the current meaning of such concepts in order to make them more realistic and to bring about progressive change. The term political economy had fallen into disuse from the late nineteenth century until the 1950s. It was only in the 1960s that the old term was revived. Although the central ethos of political economy since the 1960s is derived from Marxian thought, there are several variations on this theme. Besides, in the 1960s, the term political economy was also appropriated by the "radical libertarian right" (especially at the University of Chicago). They adopted a public choice theory perspective in political economy focused on the problem of choosing from among alternatives. Every facet of human

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life was examined in terms of the rational choice theory. Considerable attention was given to the nature of the state, political choice, and decision making. Indeed,

> it is difficult to find a common thread among the many uses of political economy within geography, but if one exists it is that in all practices the political and the economic are irrevocably linked; a sentiment not that distant from that proposed by the originators of the term (Barnes, 1994, p. 447).

Following current practice Peet and Thrift (1989) have used the term political economy to encompass a whole range of perspectives which though they differ from one another, share common concerns and similar viewpoints. According to the two authors, here

> economy is used in its broad sense as social economy, or way of life, founded in production. In turn, social production is viewed not as a neutral act by neutral agents but as a political act carried out by members of classes and other social groupings. Clearly this definition is influenced by Marxism... But political-economy approach in geography is not, and never was, confined to Marxism (Peet and Thrift, 1989).

As Peet and Thrift maintain, the critical thesis to the antithesis of conventional geography developed unevenly in time and space, so that its various phases have frequently developed independently rather than in linked sequence. The three distinct phases in this development identified by these two geographers are discussed below.

Environmental Determinism and its Critics

Many commentators of the historiography of modern geography have drawn attention to the fact that geography had initially emerged as a modern discipline as an instrument of justification for the renewed Euro-American imperial expansion of the late nineteenth century (Hudson, 1977, details in Livingstone, 1992, chapter 7). Such a need was urgent, and it was further compounded by the publication of Darwin's theory of biological evolution and the rising popularity of social Darwinism in academia. The two together provided a route to explanation of the phenomenon of social-political conquest by the Europeans and Americans in terms of the natural law of survival of the able and strong species at the cost of the "weaker" ones defined in terms of the "innate" qualities of the people living in different lands and belonging to different "races". The explanation took the form of a particular kind of environmentalism: Euro-American hegemony was justified as the natural consequence of the superior natural environments of western Europe and North America. Such a perspective was put to critical examination only in the 1920s beginning with the work of Wittfogel (1929) who opposed the environmental thesis of the imperialist scholars by underlining that human labour in different forms of social organization in particular places moulded nature into different material (economic) bases of regional societies, and this was the fundamental basis of the diversity in

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social-cultural personalities of particular groups and their habitats. The conclusion was that man makes himself, rather than being made by nature. Wittfogel did not, however, altogether discount the influence of environmental forces, so that he argued that the climatically determined need for irrigation in the Orient (India and China) yielded a line of social development that greatly differed from that followed by rainfed agriculture in the West (Wittfogel, 1957). As in the case of Kropotkin, so also Wittfogel's ideas remained peripheral to the mainstream discipline which stood firm in favour of the current social order supported by the wealth derived from territorial imperialism.

Areal Differentiation and its Critique

Peet and Thrift view the 30 years period between 1920s and 1950s as the period of conventional geography's retreat from its position as the science of the origins of human nature in the face of mounting criticism of environmental determinism both from within and outside the discipline. The possibilist perspective in geography that had followed it was so vague a formulation on environmental causation that it virtually precluded systematic, theoretical, or even causal, generalizations. Later environmental geography was replaced by geography as the study of areal differentiation focused on the description of particular places and areas as unique entities. Dissatisfaction with this turn of the discipline had started surfacing in the 1940s but the criticism was muted in view of the rampant anti-communism of the postwar period. Thus Schaefer's critique of Hartshornean-Hettnerian geography was only a mild methodological criticism of the chorological position against theory and generalization in geography by underlining that geography explains particular phenomena as instances of general laws.

Quantitative Theoretical Geography and the Radical Geography Movement

The development of radical geography has already been underlined in the foregoing discussion. The basic point in this regard is that the theories and methodologies of conventional geography were proving to be utterly inadequate for the pursuit of geography as a socially relevant discipline engaged in the betterment of the human condition. The change-over in disciplinary perspectives at the time is best illustrated by the example of David Harvey, the leading theoretician of Marxist thought in post-1970 geography. Harvey had authored a comprehensive guide to explanation in geography as the spatial science of the earth's surface in 1969, a text that, because of its timeliness had become an instant success. The Harvey of the *Social Justice and the City* (1973) was, however, a transformed intellectual now busy in exploring ideas in moral and social philosophy, things that had found no place in his earlier writing.

> The journey took him through a series of liberal formulations based on social justice as a matter of eternal morality, to Marxism with its analysis

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> of the injustices built into specific societies; and from an interest in material reality merely as a place to test academic propositions, to the transformation of capitalist society through revolutionary theory (Peet and Thrift, *op. cit.*, p. 6).

This represented the usual route to radicalization of thought in the 1970s. Though in the early 1970s, the political persuasion in geography had adopted a generally liberal perspective, by the second half of the decade, geographers turned increasingly to Marxian ideas and methodology. Now radical geography (Peet, 1977) was engaged in the examination of almost every geographical aspect of life under the capitalistic system of social organization, including topics such as the geography of women, slums, mental retardation, rural areas, housing, planning and migrant labour.

In the 1980s, the radical movement in geography had become more mature and, therefore, sober in approach. This was brought about by four factors:

- Marxist thought had been put to considerable critical evaluation so that there was hardly anything like fundamental Marxism.
- The 1979–1983 economic recession, and closer knowledge about the ground realities in socialist countries of the world had made revolutionary politics a less attractive proposition.
- The relaxed academic style of the generalist human geographer was replaced by the narrower professionalism of the 1980s.

Some of the revolutionaries of the earlier period were now comfortably placed in the establishment. By the end of the 1980s the critical style of thought had become part of the general methodology of research in geography, which had become increasingly analytical and problem-solving in a societal context. Political economy is no longer problematic; it is one of the central perspectives in research in current human geography.

To sum up, the fundamental premise of political economy perspective is that whereas production of goods and services may be viewed largely as economic processes, the distribution of the surplus value of production by the system is pronouncedly a political process defined by the pattern of power distribution within society. Thus, the nature of production, and the pattern of distribution of surplus value differs from country to country, so that politics and economy are inseparably interrelated. Indeed, political economy implies that the various aspects of life are inseparably linked and any one aspect cannot be understood without taking into consideration the relevant parts of the other aspects so that social science research is essentially holistic. In such holism, the political factor, the state, to be precise, plays the key role since politics pervades all aspects of life in the current phase of civilization. One reason why human geography was a late adopter of the political economy perspective in study was its failure to appreciate the nature of the state as a socio-political instrumentality to guide relations between communities and groups and between the people (the nation) and

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the territory of their inhabitance. Part of this casualty is explained by the depressed nature of political geography which since its chorological reincarnation in the 1930s and right through the 1960s phase of geography as spatial science had remained indifferent to the nature of politics within the state. Such an appreciation began only in the second half of the 1970s. As Johnston (1997, p. 258) has underlined, just as geography as science of space and place is integral to the pursuit of social science so also is political geography integral to geography in view of the central role played by the state in the operation of the economy and society in any segment of the organized earth's space.

GEOGRAPHY AND SOCIAL JUSTICE

One conspicuous outcome of the rise of the political economy perspective in human geography as the dominant philosophical focus in the 1970s was the rising importance of social geography within human geography. It became the branch of geography focused on the study of social relations in space and the spatial structures that underpin those relations. Under the impact of the rising tide of radical thought in the social sciences (and thus in geography) since the late 1960s, social geography had for a time in the 1970s become virtually synonymous with the whole field of human geography. In the 1980s, the earlier focus on economic efficiency (and implied economic determinism) in the study of social/human sciences was progressively replaced by increased emphasis on the role of culture. Culture began to be viewed as an active force in social reproduction—"the negotiating process and the product of the discourses through which humans signify their experiences to themselves and others" (*The Dictionary of Human Geography*, Smith, 1994a, p. 116).

Currently social theory increasingly focuses on culture as a *text* which the researcher is obliged to interpret ethnographically through the textual processes of representation (or interpretation). Postmodern perspectives in current social science increasingly view human activity as culturally encompassed and, therefore, open to variable interpretations depending upon the researcher's perspective. Thus, the 1980s had witnessed the virtual merger of social and cultural geography. As practised in the 1970s and 1980s, social geography was very different in content and approach from the subfield projected under this name in the spatial science phase of human geography in the 1960s. In his essay in the *Frontiers of Geographical Teaching* (1965), Pahl had defined social geography as the field of study focused on "the theoretical location of social groups and social characteristics", i.e., a field of study focused on patterns rather than the underlying processes.

The new social geography of the 1970s, under the influence of the revised Marxist perspectives and French sociology (as developed by Castells), became a pronouncedly politicized social geography. Almost simultaneously, the increased focus on humanistic geography brought to social geographical studies a renewed concern with human subjectivity, including the emphasis

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on understanding the patterns which arise from the use different social groups make of the space *as they see it*. Although initially the two perspectives in social geography had appeared somewhat contradictory, most workers soon realized that simultaneous focus on social justice and humanistic emphasis on the role of human subjectivity were far from contradictory in practice.

Social justice is aptly described as a pursuit concerned with the study of the distribution of society's benefits and burdens, and the way this comes about. Thus, focus on social justice inevitably involves questions of morality and ethics, so that attention is inevitably focused on the distribution of income and other sources of need satisfaction on which the material condition of a population depends. Its general starting point is a pronounced focus on *equalitarianism* wherein considerations of individual differences in strength, skill, intellect, family, ethnicity, place of origin and residential location etc. are considered morally irrelevant in deciding the quantum of societal benefits and burdens to be shared between peoples and communities.

Although we generally trace the geographer's concern with social justice to the rise of radicalism in the late 1960s (which took the form of a strong movement in the 1970s), it is far from true that geographers in the earlier periods of the discipline's evolution were completely indifferent to questions of morality and ethics. We have discussed how Humboldt's regional study of New Spain had set an early model for the geographer's focus on social justice in a regional context. The case of Kropotkin (and Elesee Reclus before him) is well known, but owing to the European societies' current focus on territorial imperialism with its inherent philosophy of racial discrimination and environmental determinism, the voices of the likes of Kropotkin and Reclus were mere cries in the wilderness. As David Smith (1994b) has underlined it, before the 1970s the geographer's interest in philosophy (wherever it existed) was generally expressed in concern over epistemology incorporated in debates on the nature and method (or "philosophy") of geographical inquiry, so that most geographers remained content with the task of landscape analysis and regional synthesis--concerns which were, in the post-quantitative period, replaced by the search for pattern laws and other forms of locational/spatial analysis. Then under the combined influence of economics, regional science, and sociology

> human geography came to model itself on those social sciences which had most successfully aped the physical sciences in their commitment to numerical precision, theory construction and the search for laws. Faith in value-free social science was strong enough to submerge the actual value content of the new human geography (Smith, 1994b, p. 5).

It was to be soon realized, however, that mechanistic interpretations based on the concept of economic rationality were inconsistent with the day-to-day reality of life, so that by the middle of the 1960s focus was slowly shifting to the study of human behaviour and of the factors (rational and "irrational") that influenced that behaviour. The shift of focus on behaviour soon led to a concern for the human condition in particular

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places (both by the humanist and the Marxist scholars) in the early years of the 1970s. The emerging concern for social relevance in geographical work marked the real beginning of the geographer's concern with questions of equity and inequality, with morality and ethics in the distribution of social goods and bads, and, therefore, with questions of social justice.

As analysed in the preceding discussion, to begin with, this concern was expressed in an attempt to map inequalities in a spatial context with a view to highlighting the problem and thereby to influence, and engage in, the formulation of governmental policy in favour of the poor and under-priviledged sections. However, a focused view on social justice had emerged by the mid-1970s following the publication of Harvey's formulations in *Social Justice and the City* (1973) wherein he advocated that focus on social justice in geographical work should be based on factors such as priorities based on the ordering of needs, contribution to the common good, and merit in the distribution of benefits and burdens of society. It was argued that a just distribution of social income should be such that the needs of the people in each area are adequately met in an equitable manner; resources should be allocated in such a way as to maximize interterritorial multiplier effects; and distribution of developmental funds should be made in such a way that the areas suffering from environmental and other disabilities are given additional help to catch up with the general standard obtaining across the national space.

Harvey's formulation had set a general trend, but (as analysed in the foregoing discussion) the theme of social relevance inevitably was pursued by the somewhat contrasting perspectives of liberalism and reformationism on the one side, and radical Marxism, on the other. However:

> it was a resurgence of humanism, itself in part a critical response to the new economic determinism not far below the surface of much structuralism, which eventually generated renewed interest in what might broadly be described as the moral dimension of geographical inquiry. The 1980s saw increasing attention devoted to race and gender, and to the position of marginalized groups of "others" disregarded in mainstream human geography. ... Power was to be transferred to the researched, instead of exclusively subjecting them to the "gaze" of external and supposedly objective observers, who were themselves developing greater awareness of their own environment and identity (Smith, 1994b, p. 6).

Focus on social justice meant a simultaneous switch over to value-based considerations in the pursuit of the geography of man. The focus on values inevitably called for a new set of study procedures. The most conspicuous development in this regard was the increased adoption of qualitative research methods ranging from passive observation and personal reflection, through routine participation, to active intervention—the common theme in all this being a preoccupation with systems of shared meaning, subjective understanding (rather than statistical description) with a view to emancipate rather than to generalize and predict. Thus semi-structured interviews now had replaced the formal surveys of the earlier phase. Human

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geography's renewed focus on ethical and moral issues had occurred in the context of a fundamental change in the intellectual environment marked by the emergence of the postmodernist challenge to the established ways of "modern" thinking based on the principles of rationality initiated in the age of the eighteenth-century Enlightenment that promoted the search for grand theories or meta-narratives. Postmodernism in social thought is sceptical of grand theories in the field of social sciences since it focuses on human diversity and difference so that it insists on place specificity in social explanation.

As in the case of other professions, in academic work also questions of ethics and morality inevitably arise. Indeed, the very choice of the theoretical mode of explanation adopted is in itself a moral decision, as for example the researcher's choice between the public choice theory and radical Marxism. Smith illustrates the problem involved in the context of the study of inner-city poverty in the West:

> One approach would be to observe the spatial association between poverty and population characteristics, finding perhaps that members of particular racial and economic groups...were concentrated in the poverty areas, which could lead to the conclusion that there is something about their way of life predisposing them to poverty. Another would be to observe the spatial mismatch between inner-city residential areas and the concentration of employment opportunities elsewhere, concluding that the problem was one of spatial accessibility. A third explanation could be found in the operation of the markets for labour and housing in a capitalist economy, which tends to consign some people to unemployment and poverty and to place many of them in the inner city... (T) here is something in each explanation. But which one we prioritize involves a moral judgement; we are allocating responsibility for inner-city poverty. The first explanation blames the victims, the second the spatial structure of the city, and the third the prevailing mode of production. Each of these will suggest different solutions: respectively, changing personal behaviour, improving urban planning, and abolishing capitalism (Smith, 1994b, p. 9).

Likewise, the choice of a particular technique of data collection and analysis may also involve moral questions, as for example the choice between qualitative and quantitative modes of analysis, and that between participant observation and structured questionnaires.

The changed perspectives under the impact of postmodern thought which places a premium on place specificity in social explanation (as against the earlier emphasis on universal processes and grand theories), has given a fresh impetus to questions of morality and ethics in geographical work. Thus, the Social and Cultural Geography Study Group Committee (1991) of the Institute of British Geographers had called for investigations into the geography of everyday moralities, that is, of how particular peoples in particular places hold particular sets of views regarding what constitutes good or bad, right or wrong, and just and unjust—since these represent the codes which "glue together their assumptions and arguments". That ethics, morality and social justice are now clearly on the agenda of human

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geography's research priority is obvious from events such as the publication of the April/May 1994 special issue of *Urban Geography* edited by G. Laws, and the special session organized at the annual conference of the Association of American Geographers to celebrate the twentieth anniversary of the publication of Harvey's *Social Justice and the City*. These have since been followed by a detailed text on *Geography and Social Justice* by David Smith (1994b) to whose work much of the discussion under this section is owed. This revived interest in questions of social justice in geographical work in the 1990s is, like other phases of conceptual change, by way of the discipline's response to the challenges posed by contemporary events, in the present case by the collapse of the established social order in Eastern Europe and the former Soviet Union, which has left

> large areas of the world with massive populations the task of creating new economic, political and social institutions, and deciding how economic rewards and positions of power would be distributed. A market-regulated economy and democratic political system was assumed, but this did not provide ready answers to some crucial issues as to how such a society is created. The privatization of state property is an obvious activity which requires clear rules, fairly adopted, if it is not simply to replace one pattern of domination by another (Smith, 1994b, p. 12).

MODERN GEOGRAPHY AND WESTERN MARXISM: THE SUBORDINATION OF SPACE IN SOCIAL THEORY, 1880–1920

Modern geography in its post-Ritterian phase of the late nineteenth century, and the system of thought associated with the ideas of Marx and Engels, were both products of the *fin de siecle* of 1880–1920—a period that generated a distinctively different culture and consciousness of space and time from that which preceded it. As Kern (1983, pp. 1-2) has noted, from around 1880 to the end of the First World War, a series of sweeping changes in technology and culture had given rise to distinctive modes of thinking about and experiencing time and space. "Technological innovations including the telephone, wireless telegraph, X-ray, cinema, bicycle, automobile, and airplane established the material foundation for this orientation; independent cultural developments such as the stream-of-consciousness novel, psychoanalysis, Cubism, and the theory of relativity shaped consciousness directly. The result was a transformation of the dimensions of life and thought".

Strangely, however, this period was also marked by concurrent and progressive consolidation among social science theorists of an interpretative prioritization of time over space—history over geography. This was visible at every level of philosophical and theoretical discourse: "from ontology (how we define the nature of being in the abstract) and epistemology (the study of how we know or accumulate reliable knowledge about the world) to the explanation of empirical events and the interpretation of specific social practices, the historical 'imagination' seemed to be annihilating the geographical" (Soja, 1989, p. 323). The tendency toward an *historicism of theoretical consciousness* had become so pervasive by the end of this period

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that it remained virtually unquestioned for almost the next half century. Historicism became the central motive of the newly emerging social science disciplines as well as in the current Marxist discourse. In such a scenario modern geography was "squeezed out of the competitive battleground of theory construction and the attempt to make sense of the dramatic changes affecting then contemporary society and social life", so that "the once much more central role of the geographical analysis and explanation was reduced to little more than describing the stage-setting where the real social actors were 'making history'. Social theorization thus came to be dominated by a narrowed and streamlined historical materialism, stripped of its more geographically sensitive revisionisms (e.g. the utopian and anarchist socialisms of Fourier, Proudhon, Kropotkin, Bakunin)". As Soja (*op. cit.*, p. 324) has underlined, "There was great sensitivity to geographical issues in the writings of Lenin, Luxembourg, and others, especially to the complexity and possible necessity of geographically uneven development (*cum* imperialism) in the survival of capitalism". However, all through this period Marxism remained overwhelmingly historicist in perspective and approach, so that in Marxist analysis the motive force behind uneven development was viewed as quintessentially historical—representing the process of making history through the struggle of social classes. The Marxists viewed the geography of this process as "an external constraint or almost incidental outcome. History was the emotive 'variable container'. Geography [in the words of Marx] was an 'unnecessary complication'". The net result was that "the *instrumentality of space* was increasingly lost from view in political and practical discourse. The politics and ideology embedded in the social construction of human geographies and the centrally important role which the manipulation of these geographies played in the survival of capitalism seemed to become increasingly invisible and mystified" (Soja, *op. cit.*, p. 325). Thus, pointing to the inadequacies of the contemporary social science (Marxist) discourse of this period, Lefebvre (1976, p. 21) drew attention to the missing link in the following words: "Capitalism has found itself able to attenuate (if not resolve) its contradictions for a century, and consequently, in the hundred years since the writing of *Capital*, it has succeeded in achieving 'growth'. We cannot calculate at what price, but we know the means: *by occupying space, by producing a space*". Thus, Lefebvre asserts, "Space has been shaped and moulded from historical and natural elements, but this has been a political process. Space is political and ideological. It is a product literally filled with ideology" (Lefebvre, *op. cit.*, p. 31).

Such an emerging wave of realization about the missing link in the Marxist system of analysis of social relations in the past, paved the way for according greater attention to the role of spatiality in social organization, so that the 1970s witnessed considerable fusion between the historical materialist and spatial perspectives in understanding human organization and social relations. On our side, this was witnessed in the rise of the so-called Marxist geography. But before commenting upon this new turn of

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events, it is relevant to review the reasons as to why historical and geographical imaginations came to be separated the way they did in the 1880–1920 *fin de siecle* period. As Soja (1989, p. 326) wrote:

> Part of the story is probably related to the explicit theoretical rejection of environmentalism and all physical-external explanations of social processes and the formation of human consciousness, with human geography being thrown out with the bathwater of environmental determinism. Another part of the story...has to do with the modernist political strategies which were developing at this time. Those seeking the demise of capitalism, for example, tended to see the spatial consciousness and identity—in localism, regionalism, nationalism—a dangerous fetter on the rise of a united world proletariat or a deviant and utopian "fetishism" of territorial society, equally necessary to combat especially at the level of the capitalist state. Those seeking reformist solutions saw in a similar phenomena an uncontrollable inefficiency, over-eager rebelliousness (when in opposition to national patriotism), and a possible threat to the expectantly benevolent power of the state and instrumental social "science".

It was therefore inevitable that geography should get isolated from mainstream social science discourse. No less influential in perpetrating this isolation was the geographers' perception of the Kantian view of classification of knowledge in terms of which the separation of geography "from both the specialized and substantive disciplines in the social sciences (where social theory was assumed to originate) and from history, its allegedly co-equal partner in filling up 'the entire circumference of our perception'" helped to rationalize this separation. Our disciplinary tragedy lay in that "by this time, putting phenomena in a temporal sequence had become much more significant and revealing to social theorists of every stripe than putting them beside each other in space". The net outcome was that:

> The historian as social critic and observer, history as a privileged interpretative perspective, became prevalent and accepted in academic and popular circles. In contrast, geography and geographers were left with little more than the detailed description of outcomes, what came to be described as the areal differentiation of phenomena.... It was almost as if a high wall had been raised between time, being, and society on one side, space on the other, keeping human geography and the social production of space apart from history, its making, and its makers... [So that] Modern geography was reduced primarily to the accumulation, classification, and theoretically innocent representation of factual material describing the areal differentiation of the Earth's surface—what in more contemporary terms might be called the *outcomes* of geographically uneven development. ... [This had continued until late 1960s, since] with postwar recovery and economic expansion in full flow throughout the advanced capitalist (and socialist) world, the despatialization of society was at its peak (Soja, 1989, pp. 327-328).

The half century old separation of geography and Western Marxism (as distinguished from the increasingly orthodox Marxism-Leninism that prevailed in the Soviet bloc, which regarded the liberal Marxism on its

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western periphery on mainland Europe as revisionist) began to loosen in the 1960s. At first, it was essentially a one-way traffic of ideas from Western Marxism to modern geography which saw the birth of a distinctively Marxist Geography which, in the 1970s, led to the rise of a new critical human geography primarily as reaction to the increasingly "establishmentarian positivism of mainstream geographical analysis". Though the new critical Marxist geography helped to shake the foundations of the value-free spatial science ethos of the positivist new geography, by and large human geography remained unsettled in its critical stance so that spatial analysis continued to be business as ever. As Soja has noted, since around 1980, the scope of the encounter between modern geography and Western Marxism has expanded and the flow of ideas has begun to move in both directions, so that a critical debate on the appropriate theorization of space focused on the spatiality of social life had started challenging many of the long-established traditions of Western Marxism. Out of this two-way flow of ideas between geography and Western Marxism "has come a compelling call for a significant reformulation of social theory based on a radical change in the ways we look at, conceptualize, and interpret not only space itself but the whole range of relationships between space, time, and social well-being; between human geography, history, and society.... For the first time a powerful argument is developing around the need for an explicitly historical and *geographical* materialism, a far-reaching rethinking of basic Marxist principles that would allow the 'making of geography' to combine with the 'making of history' as the interactive presuppositions of social consciousness, social structure, and social action" (Soja, *op. cit.*, pp. 318-319). In the words of Harvey (1985, p. 144), for the reformed critical human geography of today, "The historical geography of capitalism has to be the object of our theorizing, historico-geographical materialism the method of inquiry". This, along side other related developments, have marked the birth of what may be described as "*postmodern* critical social theory that effectively incorporates the best of modern geography and Western Marxism but transcends their disciplinary identities and traditions" (Soja, *op. cit.*, p. 320).

GEOGRAPHY AND SOCIOLOGY

Closely related to the rising intercourse between modern geography and western Marxism since the 1970s was the development of close interaction between the geographical and the sociological perspectives in human geography. Geography and sociology both are in a way "parasitic" in nature, in that both depend on other sister disciplines for the raw material of their research. In the case of sociology, its "autonomy" is diluted by the fact that there is a multiplicity of perspectives on society so that sociological concepts and propositions cannot be easily demarcated from commonsense concepts and propositions. As such it is difficult to establish some kind of a progressive research programme in sociology. Accordingly, it specializes in theoretical

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innovations about social structures and relations which may often originate in discourses outside sociology itself. Thus sociology has the function of promoting inter-discursive debate and confrontation of a theoretical nature on questions relating to the social dimensions of human life. And in sociology, for reasons of its *parasitic* nature, there are few do's and do'nt's prescriptions. In geography, by contrast, the discourse is more centralized (at least it has been so until recently) in that there was a good deal of prescription regarding what should or should not be included in geographical work. Broadly speaking, geography has focused on seeking explanation of the spatial distribution of particular phenomena—physical, economic, social and political—in terms of one or more other phenomena. The social phenomenon is present in geography in the sense that much of the subject matter of geography concerns the spatial distribution of social (human) phenomena. "However, there is conflict over the exact degree to which the character of social relations should enter into either the description of what is being explained, or into the processes which are supposedly explaining the phenomena in question" (Urry, 1989, p. 296). This is where the opening up of geography to Western Marxism was crucial in bringing about the marriage between the sociological and the geographical imaginations. This was "facilitated by the fact that perhaps *the* central concern of geography is the relationship between human being and nature, which is of course the basis of Marxism.... [O]ne consequence has been that social relations...became more central to geography and this resulted in an increased openness to the concerns of sociological discourse."

Commenting upon the separate development of the two disciplines of sociology and geography between 1920–1970, Urry has noted that:

> Broadly speaking...from World War I until about 1970, the two disciplines ...proceeded to develop separately. The social and the spatial were viewed as distinct domains which did not have much to do with each other. Sociology and especially geography were transformed into well organized academic disciplines centred around certain mechanisms of inclusion and exclusion. Academic reputations came to be made within *each* discipline; in turn they generated new subdisciplines. The subdiscipline of social geography was, significantly, rather slow to develop in this period. The only subdisciplines which did cross the sociology-geography divide were those of urban and rural sociology... (Urry, 1989, p. 301).

On the post-1970 development he comments

> There have been numerous ways in which constructive overlap has recently developed between sociology and geography Perhaps illustration of this is found within the writings of the "sociologist" Giddens and the "geographer" Gregory and their mutual interest in post-Marxist social theory and Hagerstrand's time geography.... Also overlapping developments have occurred in the study of housing, race, gender, territoriality and the state... (*op. cit.*, p. 304).

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8

The Regional Concept and Regional Geography

The concept of region is one of the most fundamental concepts in geography. For a long time it has been the principal organizing concept in geographical work. Yet, as in the case of a host of familiar ideas, "the concept of region floats away when one tries to grasp it, and disappears when one looks directly at it and tries to focus. Like the ideas of Time and Art it is so obvious yet so difficult to define, but equally so useful, so much part of geography" (Minshull, 1967, p. 13), that a definition must be attempted. However, owing to the ill-defined nature of the concept, there has never been a commonly accepted definition of "region", so that in a wide-ranging survey of this concept in the late 1930s, two nongeographers, Odum and Moore, had collected as many as 40 different definitions. Such a wide variety of definitions of a single concept underlined the fact that the concept of region has been somewhat personal and special to each major practitioner. Region has been variously defined as:

> A domain where many dissimilar beings, artificially brought together, have subsequently adapted themselves to a common existence.
> —P. Vidal de la Blache

> A complex of land, water, air, plant, animal and man regarded in their special relationships as together constituting a definite, characteristic portion of the earth's surface. —A.J. Herbertson

> An area characterized by similar surface features and which is...contrasted by neighbouring areas. —N.M. Fenneman

> An area delineated on the basis of general homogeneity of land character and occupance. —R.S. Platt

> A geographic area unified culturally, unified at first economically and later by consensus of thought, education, recreation etc. which distinguishes it from other areas. —K. Young

Although a source of considerable confusion to the student, this great variety of definitions also underlines the usefulness and strength of the concept of region, which is required by every serious student of geography, and which has proved quite capable of growth and adaptation as directions

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in geographical research changed over time, from the preclassical focus on the physical environment to the concept of geography as integrated discipline of man-environment relationships in particular places, to the Hettnerian concept of geography as the study of areal differentiation and regional systems.

Although chorology has a hoary tradition dating back to the ancient Greeks, the regional tradition in modern geography is traced to around 1800 A.D., when emphasis in the study of the earth's surface shifted from an overriding concern with the development of metrics of recording absolute locations (including the evolution of map projections and the associated task of compiling and revising maps) to the problems posed in recording what places, now accurately located, are like and how far one place is similar to or different from another (Abler, Adams and Gould, 1971). Alexander von Humboldt and Carl Ritter—the twin founders of modern geography—were the original pioneers in this field, so that a host of German geographers in the 19th century devoted a great deal of attention to refining the framework within which geographers should describe the assemblage of phenomena of diverse origins existing together in particular places. The most distinguished nineteenth century contributor in this field was the German geographer Ferdinand von Richthofen (1833–1905), who in his inaugural lecture (delivered on assuming the chair of geography at the University of Leipzig) in 1883, defined the distinctive purpose of geography as a field of learning to focus on the diverse phenomena occurring in interrelation on the face of the earth. He evolved a framework for the study of geography that is frequently referred to as the classical approach to regional geography. The framework of study started with the natural/physical environment and proceeded therefrom to analyse the distribution of man and his activities in different parts of the earth's surface. Such an approach to understanding the earth as the world of man was carried to its finest tradition in France by Reclus, and later on by Vidal de la Blache and his school of regional geography.

An important input in the regional tradition in geography, focused on comprehending the earth's surface in terms of its constituent parts (the regions), lay in the widely prevalent nineteenth century notion that although God could not be experienced in a direct sense, He is omnipresent and the observable phenomena on the earth's surface represent His handiwork; as such: "the greater our understanding of nature, the greater our knowledge of the works of God and, therefore, the nearer we would approach Him" (Chisholm, 1975, p. 32). Another important influence came from the concept of "oneness" or "wholeness" of things, associated with the philosophy of Hegel (1770–1831), who advocated that the researcher was required to "comprehend the entire universe" and that he must try "to know the infinite and to see all things in God". The Hegelian concept of wholeness had had a profound influence in geography, one which, Chisholm contended, was "obscured by the perhaps undue attention geographers have given to Immanuel Kant" (who is widely credited to have given geography its place in the overall framework of organized objective knowledge):

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> In the name of Kant an essentially Hegelian view of the world was adopted, especially by Hettner, who in turn exerted a major influence upon Hartshorne...Although.... Kant is widely quoted by geographers, and revered for giving us a place in the sun, it is really the ideas of Hegel and his concept of wholeness or totality of things that has been pervasive in geographical work.... The geographer's most important traditional form of this concept of wholeness of phenomena is the concept of region or landscape...[through the study of which] the geographer could attempt to understand the totality of phenomena and their interrelationships. Furthermore, the notion of landscape, embodying the sum of natural and human phenomena, was thought to enable the student to make teleological inferences concerning man and his relationship to the natural environment (Chisholm, *op. cit.*, pp. 33-34).

Later on, as a result of the rapidly spreading influence of the Darwinian theory of evolution, and its supportive concepts of organization, natural selection, and the role of randomness and chance, teleology was soon forgotten but the regional framework of analysis had continued as the fundamental concern in geography. Elaborating upon the concept of region, Hettner (1927) wrote:

> Reality is simultaneously a three-dimensional space, which we must examine from three different points of view in order to comprehend the whole.... From one point of view we see relations of similar things, from the second the development in time, from the third the arrangement of phenomena and their distribution in space. Together with systematic...and...historical... sciences, there must develop chorological or space-sciences.... As history studies the character of different times, so geography studies the character of different areas and places—"the earth-spaces filled with earthly contents", to use Ritter's expression—it studies the continents, regions, districts, and localities as such (Hettner, 1927; cited in Hartshorne, 1939, pp. 140-142).

THE REGION

The Whittlesey Committee on regional geography which drafted the document on regional geography published in James and Jones (1954) clarifying the concept of region in geography observed as follows:

> Any segment or portion of the earth's surface is a region if it is homogeneous in terms of such an areal grouping. Its homogeneity is determined by criteria formulated for the purpose of sorting from the whole range of earth phenomena the items required to express or illuminate a particular grouping, areally cohesive. So defined, a region is not an object, either self-determined or nature-given. It is an intellectual concept, an entity for the purpose of thought, created by the selection of certain features that are relevant to an areal interest or problem and by disregard of all features that are considered to be irrelevant (Whittlesey *in* James and Jones, 1954, p. 30).

But, as one author put it, there is, of course, only one region—the surface of the earth—on which mankind finds its home, "although much

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effort is devoted by geographers towards the study of this diversified environment as a whole, it has long seemed necessary by methods of 'special' or 'regional geography', to study its component parts", so that although nature abhors lines, geographers "appear to adore them, so busily do they engage themselves in delimiting on their maps allegedly significant areas called 'regions'" (East, editorial preface to Minshull, 1967, pp. 9–11).

The term "regional geography" had originally been used to distinguish a new teaching method from the traditional political geography in which an encyclopedic collection of data, organized by political units, was presented to be memorized by the student. In this sense *regions* represented just another type of unit area—"just another receptacle", as James called it—so that to many the region appeared as *omnium gatherum* of information about particular areas. Wright branded it the "trash can approach", in the sense that it appeared to him to consist of describing the contents of an arbitrarily defined "container" (James, 1972, p. 461), so that many felt that in the absence of a sound philosophical basis as a branch of learning, regional geography, as taught and as written, presumed too much and achieved too little (East, *op. cit.*). In an influential paper, Kimble (1951) discussed "the Inadequacy of the Regional Concept", wherein he suggested that "regional geographers may perhaps be trying to put boundaries that do not exist around areas that do not matter".

Notwithstanding the growing dissatisfaction with region and regional geography since the 1950s, there has always been a strong body of opinion in the English-speaking world favouring the view that "in its simplest essence the geographical problem is how and why does one part of the earth's surface differ from another", and that "The purpose of regional geography is simply the better understanding of a complex whole by the study of its constituent parts" (Wooldridge and East, 1958, pp. 28 and 159). According to Wooldridge, "the aim of geography" is "to see nature and nurture, physique and personality as closely related and interdependent elements in specific regions" (Wooldridge, 1956, p. 53). So central did the study of regional geography appear to geography as a discipline that Wooldridge advocated that in every department of geography each member of the staff should commit himself to the study of a major region.

However, the regional geographers of the old persuasion were, in a sense, engaged in fighting a losing battle. Thus, commenting upon the Vidalian tradition of the French regional geography, Wrigley underlined that

> It was essential to the best flowering of Vidal's method that the society living in an area should be "local" and that it should be basically rural. It must be local in the sense that the bulk of the materials used as food, for building, for fuel, in the manufacture of tools and machines and so on, should be local in origin

so that

> The method developed by Vidal de la Blache is admirably suited to the historical geography of Europe before the Industrial Revolution, or indeed

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> to the limited and shrinking areas of the world today whose economies are still based on peasant agriculture and local self-sufficiency..., but it is not applicable to a country which has undergone industrial revolution (Wrigley, 1965, pp. 8–10).

But as Wrigley (p. 13) pointed out,

> There has been, however, little, if any retreat from regional geography, if by that one means the study of things in association in an area, which still affords endless opportunities for ad hoc studies. The regional method thus remains the means for much geographical work but is no longer its end. One may say that much geography is still regional, but no longer that geography is about the region.

The Region as a Concrete Unit

The search for the most suitable areal unit on the basis of which the earth surface as the world of man could be comprehended, has been a persistent problem in geography. To begin with, political entities were used for this purpose. Gatterer (1727–1799) was the first to advocate discarding of political units in favour of *natural regions* into which the earth surface was believed to be divided, according to Buache's (1700–1773) theory, which postulated the existence of a continuous network of mountain ranges that divided the earth surface into well-defined regions. However, after Buache's theory was proved to be unfounded in reality, the concept of natural regions was not abandoned; it was modified in the light of new information so that under the lead given by Ritter, the concept of natural regions got established as the fundamental premise in the study of regional geography. In the post-Ritterian period, interest in regional geography had considerably declined, but, by the beginning of the twentieth century, interest in regional studies was once again revived, and the concept of the region as a definite, concrete unit (or genuine entity) reappeared in the geographical methodology advanced by Schuter (1872–1952). Schuter regarded the region or *landschaft* as a concrete unit possessing a form or structure, and he believed that different regions on the face of the earth are intimately related, so that the earth's surface may be conceptualized as being made up of a mosaic of individual landscapes or regions. In line with the concept of Schuter, Carl Sauer regarded landscapes as concrete objects forming individual unitary wholes that "have form, structure, and function, and hence position in a system" (Sauer, 1925). Thus, for a good number of regional geographers, the region became an organic entity comparable to biological organisms. According to Passarge (1867–1958), the concept of region as a concrete unitary object owed its origin to reaction against the concept of region as merely an analytical method, as pioneered by Hettner (cited in Hartshorne, 1939).

According to Hartshorne (1939, p. 271),

> the thesis on "natural regions"—individual and distinct areas determined by the non-human elements—whether in its original teleological form or

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> in its more modern presentations, is unconsciously based on the assumption of a single sequence of control in the interrelations of natural phenomena.

In reality, however, there is little relation between the climatic divisions of the earth and its major landforms, and the most important factor that "prevents any great correspondence between the regions of different elements is formed by the entire group of transport or 'circulatory' phenomena, in the air, the waters, and even on dry land (mass movement of soil)". Indeed, Hettner (1927) himself wrote that the point missed by the proponents of natural regions was that

> The earth surface owes its nature not to a single cause but to a great number of causes which have nothing to do with each other.... The tectonic and climatic phenomena create...two separate though coexistent groups of causes. Most of the other geographical facts are conditioned by these in one manner or another, not, however, certain ones by one of these, others by the other, but most of them by both together...[while] many important geographical conditions are not based on present causes but those of the past (cited in Hartshorne, 1939).

The attempt to enshrine regions as concrete individual objects was part of the general endeavour, at that time, to elevate geography to a position at par with the systematic sciences, each focusing on a particular class of objects. The geographers, however, lost sight of the fact that

> one essential element that distinguishes geographic thought from that of all other sciences, namely the constant consideration of the relative location of things on the earth's surface with reference to each other.... Theoretically one might talk of the relative location of the region as a unit in reference to other such units, but any attempt to analyze a concrete situation in such terms reveals the fundamental fallacy: regions do not have relations to each other as units—only particular elements and complexes of elements within regions are related to those in others (Hartshorne, 1939, p. 281).

Kinds of Regions

The Whittlesey Committee has identified a variety of different kinds of regions. The most fundamental division is that between *formal* (or uniform) and *functional* (or nodal) regions. The *uniform region* represents a discrete distribution that is defined in terms of specified criteria, and is homogeneous throughout in terms of those criteria. The definition of such regions may be based either in terms of single features or in terms of a well-defined association of several selected features. The *functional region,* on the other hand, is defined in terms of the functional zone (the area of influence) around a given *node* (a city or town) or several related nodes. Such a region represents areas functionally tied to the specified node. The most important factor in the definition of the functional region, therefore, involves the measurement of movements (or spatial interaction) from a central place to its hinterland.

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Hartshorne did indeed underline the significance of the concept of functional region, but most of the discussion about regions, until after the Second World War, was concerned with the formal (i.e., single feature) region. In geographic practice, Dickinson's *City Region and Regionalism* (1947) had marked a major development in regional theory. According to Gregory,

> what was novel about Dickinson's formulation was its break from physical geography and the physical environment...and following from this, its provision of a central regionalizing principle that lies behind the "spatial structure of society"

Dickinson's city-region was

> an area of interrelated activities, kindred interests and common organizations, brought into being through the medium of the routes which bind it to the urban centres (Dickinson, 1947, cited in Gregory, 1981, p. 285).

Such a concept of region as spatial organization through movements was further advanced (and reinforced) by A.K. Philbrick (1957) who maintained that the task of human geography was to "analyze the areal structure of human occupance independent of the natural environment" and through "the functional organization of human occupance in area". Both Dickinson and Philbrick had been greatly influenced by Christaller's "central place theory". Thus the works of Christaller, Dickinson and Philbrick together "formed the springboard for the eventual translation of functional regions into spatial systems" (Gregory, *op. cit.*).

A distinguished committee of the Geographical Association in U.K. had published a widely acclaimed report of "Classifications of Regions of the World" (*Geography*, 1937). The committee (whose members included Roxby, Stamp, Unstead and Myres—the last named, a historian) distinguished between two types of regions: "Regions which fall into types ...may be said to be of *generic* character", and "Single regions, large or small, which possess a well-marked geographical individuality may be called *specific* as distinct from generic regions" (see Dickinson, 1976, pp. 144–147). The distinction drawn by the Committee is essentially one between the single-feature regions that represent a type, and the total-feature or total-topic regions that stand out as non-repetitive and unique examples.

Although regions are under consideration in each of the two types, the distinction drawn points to the existence of the two original (and equally important) branches of geography-—one called Special, and the other General geography, as Bernard Varenius had named them long ago. Special geography is concerned with the unique characteristics of segments of the earth space which result in each area from a combination of the complete physical and human environment, which is now generally referred to as regional geography. Strictly speaking, it represents complete descriptive geography on a regional basis. General geography on the other hand, is not concerned with the sum total of phenomena existing together at one place, but is focused on the distribution and variations in the occurrence of selected phenomena over the face of the earth. Thus,

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> General geography may have as much right to be called regional as has special geography, but the regions in question are of a different type. Each relief region, vegetation region or farming region has its own characteristic relief, vegetation or farming which is different from that in the adjoining regions. This type of single-feature region [also called formal or uniform region]...is homogeneous within the limits set by the observer, but while the region must be different from the adjoining neighbours, it is not necessarily unique (Minshull, 1967, p. 29).

The persistent confusion between the concepts of Special and General (i.e., Regional and Systematic) geography is easily avoided if one remembers that in General or Systematic geography we are concerned with topical studies in which the student pursues the examination of one element (or a group of mutually related elements) over the whole world (or a country, province or continent), while in Regional geography a variety of elements of diverse origins is examined in their mutual interdependence in well-defined areas delimited on the basis of selected criteria.

In a paper entitled "Southern Rhodesia: An African Compage", Whittlesey (1956) put forward the idea of "compage" as a kind of uniform region defined in terms of all the features, natural and man-made, that are related to the human occupance of the area. This represented an important conceptual progress in the study of regional geography. As Minshull (1970) wrote: those who suggest that the study of specific regions is beyond the powers of one man may well have the ill-defined total-topic region in mind; the fact is that most successful regional geographers have been concerned with what Whittlesey named as compage.

Natural Regions

In geography, we accept the single-feature regions such as those based on relief, climate, soil or vegetation, or any other related element as partial representations of reality—as models of reality—just as students of biology do in respect of their diagrams of the human body. On a worldwide pattern, it has long been recognized that in respect of soil, vegetation or climate the single-feature regions reveal some kind of intimately related repetitive patterns recurring in different continents. On this basis world patterns of distribution of climate, vegetation and soil types have long been recognized. It had generally been believed that irrespective of differences in detail, a close interrelationship existed between the global patterns of the three related elements. Owing to the apparent influence of climate over vegetation, and of these two together on soil; soil, vegetation and climate have often been combined to form "natural" regions. A grand scheme of natural regions on a global scale, by combining single-feature regions of important physical determinants of plant and animal life, was proposed by A.J. Herbertson in 1905. Herbertson's scheme of natural regions became an important tool in the teaching of geography in the educational institutions in Britain and the other countries of the British Commonwealth (as it was then called). In the course of time the so-called natural regions (subsequently called "major

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regions") taught in the school, became established in the students' mind as accepted fact.

As discussed previously, Herbertson's scheme of natural regions was greatly influenced by belief in the principles of vitalist biology. It is true, that Herbertson himself did not devote much attention to the human geography of his regions, but the following statement in his 1905 presentation clearly suggested that the natural regions proposed by him could provide a useful background to the study of human groups inhabiting them:

> By comparing the histories of the same race in two different regions; or of a succession of races in the same region, it should be possible to arrive at some knowledge of the invariable effect of a type of environment on its inhabitants and permit some estimation of the non-environmental factors in human development.

Thus, those who used his scheme of regions, generally stepped forward to prove covariance between human geographical differences in relation to differences in the natural habitat. Thereby each natural region came to be regarded by the student as the location (and cause) of a certain definite way of life, so that the role of non-physical factors such as migration, history, and tradition was completely overlooked, and geography assumed a deterministic posture. Many students of regional geography tried to make "the natural region serve as the plaster cast of a specific kind of human economy" (Kimble, 1951, p. 153).

In 1913, Herbertson restated his ideas in a paper entitled: "Higher Units: A Geographical Essay" (reprinted in *Geography* in 1965, pp. 332–342). (Excerpts from this as well as another of his papers entitled: "Regional Environment, Heredity, and Consciousness" [*Geography*, 1915, pp. 147–153] are reproduced in Dickinson, 1976). According to Dickinson (1976), the 1915 paper of Herbertson revealed a clear departure from the naive assumptions of environmental determinism of social Darwinism, in that Herbertson envisioned regions as living wholes of different orders, from a local to a worldwide scale. According to Herbertson, "The separation of the whole into man and his environment is a murderous act. There are no men apart from their environment".

Herbertson's suggestion that his scheme of natural regions could be used as the basis for the study of human groups in specific regions, was given focused attention by another British geographer, J.F. Unstead (1916). Unstead suggested that any scheme of natural regions should be based on a combination of physical and cultural features. Through a series of papers Unstead extended this idea further. His effort culminated in a broad-based system of geographical regions published in 1933. The paper suggested a hierarchy of regions with a view to "study the interactions of the various components of the great macroorganism of the earth and its inhabitants". As Hall noted, while not being avowedly deterministic, Unstead's paper "certainly pointed the way to a concept of the geographic region as being an area where society had adjusted to the local environment and where

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there was consequently homogeneity of both physical and cultural features" (Hall, 1937, paraphrased in Grigg, 1967, p. 469).

Unstead's scheme of regions was *synthetic* in approach, as contrasted to the *analytical* scheme of Herbertson. According to Unstead, regions could be defined into different degrees of generalization, so that one could start with the smallest unit area of observation, and move on progressively to higher level regions. He suggested the term "stow" to represent the smallest unit area, and "tract" for a contiguous group of interrelated stows. (The tract was roughly equivalent to the French *pays*.) Tracts could be combined to create *subregions, minor regions,* and *major regions.*

A major difficulty with Unstead's (indeed with any synthetic scheme of hierarchy of regions) is the concept of a uniform unit of area—a stow. As James (1972) wrote,

> it is clear that stow is only indivisible because it is so conceived by the observer: actually it is necessary to start with the observable fact that no two microscopic points on the face of the earth are identical and that any area enclosed by a line and described as homogeneous is only homogeneous with respect to the selected features. The face of the earth is an intricate system of interconnected features that forms a continuum of varying aspects. Regions are defined and drawn to illuminate some aspect of the problems geographers are concerned about; and in fact, it would be impossible to reach any comprehension of the earth's surface without recognizing areas of partial homogeneity.... The difficulty arises when the region is identified as a unit area, an indivisible segment of space. If the geographer were reduced to the size of an ant, he would start subdividing the indivisible stow (James, 1972, pp. 269-270).

James was referring, in this passage, to Linton's (1951) suggestion to begin with a still smaller primary unit.

Concept of Region in French Geography

Herbertson as well as Unstead had, each in varying degree, got trapped in the deterministic theory maintaining that the way people live is a reflection of their natural surroundings. The result was that the followers of their schemes of regions were led on to recognize homogeneous associations of physical and human factors in particular regions. However, such a tendency was avoided in the French school of regional geography. The French geographers, in line with the lead given by Paul Vidal de la Blache, defined their regions in terms of *genre de vie.* The region was defined as:

> A unified, functionally organized pattern of living, characteristic of certain culture or livelihood group...in which livelihood is seen as the core around which a whole nexus of physical, social and psychological bonds develops (Billinge, 1981).

In his scheme of geography Blache asserted that human occupance creates homogeneity even where natural features are not homogeneous. He drew attention to the fact that the same environment frequently leads to different responses from people with different *genre de vie,* since the

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complex of institutions, traditions, attitudes and technical skills which make up a *genre de vie* largely determine which of the many possibilities offered by nature in any given area shall be selected for development.

The Logic of Regional Systems

Regionalization in geography has for a long time been recognized as a form of classification (or division), but not until the late 1950s was the similarity between regionalization and scientific procedures of classification and division explicitly underlined. Such a recognition came as a by-product of the general call in favour of adopting quantification and statistical techniques of analysis, so that writing on "Statistical Methods in Geographical Research", Reynolds (1956) noted that "the definition of regions is essentially a classification process". Bunge (1962), De Jong (1962), and especially Grigg (1965 and 1967) had offered further clarifications on the issues involved. The work of Grigg is the basis of much of the discussion that follows.

Classification consists of grouping of objects into classes (or categories) on the basis of certain common property possessed by all the members of a class, or on the basis of some specified relationship obtaining between the objects under investigation. In the terminology of science, the objects being classified are called the *individuals,* and the totality of individuals under classification is named as the *universe* or the population. In the first stage of classification, one particular property that is possessed by all the members of the population in greater or smaller degree, is selected to serve as the basis of classification. Such a property is known as the *differentiating characteristic.* When grouping into classes is done on the basis of some similarity between objects under classification, the procedure is known as *association by similarity.* However, when the grouping is based on certain specified relationships between interconnected objects of different origins, the procedure is known as *association by contiguity.*

> Association by contiguity...is a structural and functional relationship amongst things that...may be quite dissimilar, or in any event their similarity is irrelevant. Such, for instance, is the relationship between a plant and the soil in which it grows, between a rabbit and the fox that pursues it, between the separate organs that compose an organism, amongst all the trees of a forest.... Things in this relationship to each other belong both structurally and functionally to what may be defined in a broad but technical sense as a single system (Simpson, 1961, p. 3).

On the basis of the selected differentiating characteristic, individuals are initially grouped into a number of *classes.* All classes at the same level are called a *set of classes* or *categories.* Such a first order grouping into classes may be repeated to obtain a *hierarchy of classes.* A procedure closely allied to classification is *logical division.* Whereas in classification individuals are grouped into classes and classes are regrouped into super classes, in the case of logical division, an initial class is taken as the universe, and it is divided into subclasses on the basis of some logical principle. In the case of logical division the universe we begin with is called the *genus,* which

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may be divided into *species* on the basis of some specified *principle.* The constituent species occurring at the same level are similar to a category of classes. The procedure may be carried further in order to arrive at a hierarchy of classes. Thus, in logical division, although we arrive at results similar to classification, the process is reversed: Instead of seeking similarities, we look for differences, and instead of building up, we are involved in breaking down.

> A special case of logical division is *dichotomous division,* where the purpose is not to form a hierarchy of species but to isolate single species. Thus, for example, land may be divided into arable land and non-arable land. Arable land is then divided into grain crops and non-grain crops, further division divided grain crops into wheat and non-wheat, and we have thus isolated wheat as a species (Grigg, 1967, p. 481).

The two processes, of classification and division, can be equated with the two basic approaches to acquiring knowledge: the *inductive* and the *deductive.* This has been recognized by geographers for a long time, so that Whittlesey (1954, pp. 38-39) wrote that we could arrive at regional systems either by *aggregation* or *subdivision.* The difference between the two procedures was most clearly underlined by Unstead (1916, pp. 236–241) who described his own system of regions as *synthetic,* as contrasted to Herbertson's method which was *analytical* in design, wherein the researcher started with the world as a whole, which was then divided into smaller order regions. Synthetic regionalization is analogous to classification, and analytical regionalization to division. As noted previously, classification may be done either on the basis of similarity or on the basis of a specified relationship obtaining between objects of dissimilar origins existing together. As Grigg noted, this difference is analogous to the distinction between the *uniform* and the *nodal* region:

> the delimitation of a single region, where we are isolating a particular area from the rest of the world (universe under reference) is analogous to *dichotomous division.* On the other hand, the *generic region* wherein we create a system of regions (a set of coordinate classes) is equivalent to normal classification and division. The single region is then a special case of areal classification (Grigg, 1967, pp. 482-483).

Classification, however, is a necessary first step in scientific research, for

> If each of the many things in the world were taken as distinct, unique, a thing in itself unrelated to any other thing, perception of the world would disintegrate into complete meaninglessness (Simpson, 1961, p. 2).

The purpose of classification is to give order to the universe of objects studied. Classification helps the researcher in giving a name to things possessing set characteristics, and thereby in transmitting information, and making inductive generalization.

Are regions areal classes? Starting with Hettner, many geographers have shown awareness of the scientific procedures of classification and division

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(Hartshorne, 1939, pp. 290–306), but the closest comparison between classification in science and regionalization in geography was first made by Bunge (1962, pp. 14–22), who argued that in geographical regionalization the individual is represented by "place"; and we refer to property of places as *elements* whereas the differentiating characteristics are called *criteria*. Places are grouped to create regions or areal classes. To Bunge, the similarity between regionalization and scientific classification appeared so close that he declared: "geographers have independently rediscovered the entire logic of classification systems".

Principles of Regionalization

As Grigg (1965) wrote:

> whereas many regional systems have been devised by geographers there have been relatively few attempts to suggest any principles of regional division. By principle we mean procedures which should be followed in constructing any system of regions, and which would be as applicable to a division of the whole world as for a country, and for agricultural regions or climatic regions as much as, say, religious regions.

Since regionalization is akin to scientific procedures of classification and division, the principles of classification and division may be fruitfully applied in the construction of regional systems. Grigg enumerated these principles as follows:

1. *Classification should be designed for a specific purpose; it rarely serves two different purposes equally well.* Purpose determines the differentiating criterion selected, and the number of regions delimited. Thus a set of soil regions based upon properties such as colour and texture shall not necessarily be a reliable guide to regional variety in soil productivity.

2. *There exist differences in kind between objects; objects which differ in kind shall not easily fit into the same system of classification.* This is a fundamental principle of taxonomy. Thus, stones and animals, being different in kind, cannot be put under the same classification system. In geography, land and sea differ in kind, so that they are seldom included in the same system of regionalization. As James (1952) noted, any attempt to define regions based on phenomena produced by a variety of different processes could lead to serious errors of interpretation, so that "We may find ourselves trying to add things like cabbages and kings".

This principle shall not, however, apply to the cases of classification based on the criteria of association, such as the case of ecological classifications, where forms of life—animals and plants—may be classified on the basis of their habitat. This is also true in the case of systems of geographical regions and the general-purpose regions devised by human ecologists.

3. *Classifications are not absolute; they require to be changed as new information becomes available about the object being classified.* Owing to this,

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"almost every classification which is proposed in the early stage of a science will be found to break down as deeper similarities of objects come to be observed" (Jevons, 1887). For geography the lesson is obvious: We must keep updating the regional systems used in our teaching programmes, such as Herbertson's model of major regions, or Whittlesey's scheme of agricultural regions—each needs a thorough review. The problem is all the more urgent because many regional systems used by geographers are often borrowed from other sciences. This is particularly true of soil and vegetation systems and it is not always clear whether the criteria used were the most recently developed or whether they are necessarily suited to the geographer's purpose. Thus, a map of soil regions where the classification is based upon soil genesis may not be the most suitable if the geographer is considering the relationship between soil and landuse (Grigg, 1967).

4. *Classification of any group of objects should be based upon properties of those objects. In other words, the differentiating characteristics used should represent properties of the objects being classed.* This has been frequently overlooked in a host of geographical classifications. For example, attempts have been made to delimit agricultural regions not by properties of the system of farming in practice, but by factors which are supposed to cause the observed differences in farming systems (such as, differences in soils and climate).

5. *When dividing, the division should be exhaustive, and the classes formed should exclude each other.* For instance, if one were to group people of the world into the following four classes: Hindu, Muslim, Jewish, and European; the four classes are neither exhaustive nor do they exclude each other since one may be European and Muslim or Jewish at the same time. In the case of geographical regionalization, this rule means that if an area is to be divided into regions then all parts of the area must be assigned to some region, and each to one region only.

6. *When dividing, the division should proceed at every stage, and as far as possible, throughout upon one principle.* In any regional system, regions of the same order should be based upon the same property or some degree of variation of the same property. Thus, a system of climatic regions can logically be based upon variations in annual and seasonal incidence of rainfall, or in the rate of evapotranspiration, or any other significant element of climate. It will be illogical if one were to mix up different unrelated elements and divide a country into, say, the Dry East, the Industrial West, the Highly Populated South, and the Mountainous North.

7. *The differentiating characteristic, or the principle of division, must be important for the purpose of division.* The differentiating characteristic should be so chosen as to be of help in understanding the distributional pattern in question, or the spatial relationships of the object or the problem being investigated. For this reason, *a regional system devised for one purpose may not serve another purpose equally well.*

8. *Properties which are used to divide or classify in the case of higher order categories must be more important for the purpose of division than the ones used*

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to divide lower order categories. In geography, most of our regional systems consist of regions of a single order only. Examples of a carefully designed hierarchy of regions, such as the one proposed by Philbrick (1957), are rare. This principle of regionalization implies that

> The initial division should always be upon the principle which is most important to the purpose of the division. It is not unusual to find this rule neglected in elementary regional geographies. Thus we may find that western Europe is divided into a few major regions upon the basis of physiography, and then subdivided by vegetation and further subdivided on the basis of occupational structure. Such a procedure often means that the lower order regions, which are invariably the most important units of description, separate similar areas simply because they have been earlier divided on the basis of physiography, which is largely irrelevant to the purpose of lower order regions (Grigg, 1967, p. 489).

REGIONAL GEOGRAPHY

The chorological concept of geography focused on the study of the earth's surface in terms of variations between areas (later named areal-differentiation), was originally developed by Richthofen (1883) and subsequently advanced by Hettner in Germany. It was popularized and raised to the level of the dominant concept of geography in the English-speaking world through Hartshorne's monumental *Nature of Geography* (1939). A strong tradition of regional geography had already developed in France under the leadership of Paul Vidal de la Blache. Indeed regional geography reigned supreme in the world of geographical scholarship until the early 1950s, after which the regional paradigm for comprehending the earth as the world of man began, starting with Schaefer (1953), to be attacked as one that propagated "exceptionalism" and "idiography" in the discipline and thereby led the geographer away from the fundamental goal of science, i.e., the search for general principles of behaviour. A few years earlier, Kimble (1951) had condemned the concept of region as an eighteenth century concept. Kimble maintained that "it is links in the landscape...rather than the *breaks* that impress" the scientific mind. Bunge (1966) was convinced that the regionalists' error lay in their "notion of the uniqueness of location", owing to which they emphasized *exceptions* rather than *similarities* between places and locations. Coupled with this was a general impression that the French tradition of viewing the region as an ecological unit for the analysis of human groups was no longer relevant to the study of places and regions in the post-Industrial Revolution societies like those in Europe. All this contributed to a widespread retreat from regional geography. This meant the "eclipse of a traditional component of geography which was until recently widely considered a *sine qua non* of the discipline" (Guelke, 1977).

The reason why regional geography at midtwentieth century had such a hostile reception may have been partly owing to the fact that "the people who write regional geography are not the same people who write about

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regional geography", wrote Paterson, who defined regional geography as "the work in which the purpose of the study is to clarify a specific situation in a particular locality; in which, in other words, attention is focused upon the region for its own sake and of its inhabitants" (Paterson, 1974, p. 4). As a practising regional geographer, Paterson made a strong plea for regional geography. Referring to Wrigley's foregoing comments, Paterson noted that

> it is curious...to argue that, with the overriding of local differences [in a market economy], all places have now in effect become the same place, and so the whole exercise of regional analysis should be abandoned. All places are manifestly *not* the same place, chemical fertilizers notwithstanding (p. 16).

Paterson underlined that the changes brought about by the Industrial Revolution affected the *scale* and *range* of interpretative factors rather than the process of interpretation itself:

> Formerly, the geographer may have been preoccupied with local correlations.... Now he is increasingly likely to be concerned with national, if not international, influences and effects. So long as there are contrasts between region and region, no matter to what they are attributable, there is work for the geographer to do (Paterson, 1974, p. 16).

A beneficial outcome of the post-Second World War trend in favour of interdisciplinary programmes of *area studies* in close association with geography, especially in North America, was that it conferred on regional work in geography a new measure of reality, in that the geographer studying a particular area was no longer required to master all aspects of the area under investigation—since other experts were at hand—so that the geographer could now concentrate more on "regional analysis" as the special area of his expertise. Relieved of this unnecessary burden, geographers were now encouraged to widen the scope of regional analysis to include new themes of research, such as literature, law, religion, and architecture.

During the period between 1930 and 1960, regional geography had expanded its vision to incorporate historical geographical studies involving reconstruction of the past geographies of particular areas. Likewise, *perceptual studies* also acted as a significant multiplier on the scope and content of regional geography in the 1960s and the 1970s. As a result, "the unidimensional regional study, the region as it is today, has been expanded into two new dimensions, past or present, as perceived by the observer rather than as its own object self" (Paterson, *op. cit.*, p. 17). The concept of region had received a new appraisal following the rise of behavioural and humanistic studies in the discipline.

It would appear, that the very words "region" and "regional" have been misunderstood, and so too is regional geography as traditionally practised and taught; so that Mead (1980) felt that perhaps it should never have been called regional geography, but simply "the geography of other lands", which needs to be projected at certain educational levels as a pedagogical necessity, since: "Adventurous human contact with the strange,

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the unfamiliar, the exotic, the dramatic remain central to the appeal of geography in the schoolroom—and it is in the schoolroom that most geographers are born".

Since regional feeling among groups of people today is as widespread as ever, the regional approach to analysis and resolution of problems continues to be of great relevance to the understanding of social relations.

> The functional region and the developmental region may have replaced the traditional region as frameworks of enquiry, but they too proclaim that, in one way or another, the regional concept today is very much alive. Emotion that prevails over reason and the myth that takes over reality are as significant today [as ever before]... . Change is generated by spiritual forces as well as by technical. Poets, philosophers, and artists continue to play a role in creating regional feeling. Historical experience suggests that what begins as poetry often finishes as politics (Mead, 1980, pp. 293-294).

The charge that regional geography is essentially concerned with the study of the unique cannot be fully denied, even though regions may, in some ways, be viewed as individual cases. But, as Paterson (1974, p. 22) wrote,

> this is a charge that should be readily admitted: it is indeed a concern for the unique, but only in the sense that we have one world, and one only, and most of its inhabitants have in it only one home. Beyond that concern for the unique, the regional geographer will be attentive to the application of any and every finding of his non-regional colleagues to a specific situation; in fact he will want to insist that only when hypotheses have been tested in specific regional contexts, by specialists in those regions, are they worthy of acceptance.

Regional Geography and Regional Science

Until the 1950s, regional economics was descriptive and non-theoretical, the mainstream economic theory was highly aspatial while human geography was positively anti-theoretical; so that location theory continued to be a highly underdeveloped field of study. Dissatisfaction with the prevailing state of affairs prompted American economist Walter Isard to propose a new discipline called Regional Science, which was created to serve as a bridge discipline linking economics, geography, and planning with a view to promoting a more sophisticated theoretical and quantitative analysis of regional economies and the related problems. The Regional Science Association was founded in December 1954, and branches of the Association were soon started in other countries in the 1960s by which time the discipline, under the leadership of Isard, had gained considerable respectability. Regional science helped greatly to rejuvenate the study of regional economics, and it left considerable impact on the study of human geography which at that time was deeply involved in looking for ways and means for gaining scientific respectability through the introduction of quantitative techniques of analysis and model building. Most of the leading lights of the quantitative

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revolution in geography in the 1960s and early 1970s were closely associated with regional science, which had become a major source for many fresh ideas and insights, particularly in the fields of economic and urban geography. This had led many geographers to

> assume that regional science is what regional geographers *should* have been doing all along..., *would* now be doing if its complexities were not beyond them; in other words, that the regional geographer is a failed regional scientist,...and that the relationship between the two workers is approximately that of an operative in a textile mill to the handloom weaver whom he has displaced and superseded (Paterson, 1974, p. 20).

Part of the problem lay in that in the formative period of geography as a field of professional inquiry, regional geographers were required to work for a wide range of purposes starting from topographic description, and landscape analysis to regional planning, at one and the same time, so that many of the regional geographical studies proved unsatisfactory on every count. Late in the 1950s there came some measure of division of labour between regional geography and regional science. We may briefly underline here the basic difference in the perspectives of the two fields of study.

As Paterson wrote,

> Regional science is concerned to evolve a body of theory about inter- and intra-regional relationships which may be used to solve specific problems in decision-making. It is, in this sense, problem-oriented, which means that it is by nature forward-looking and precise.

Regional geography need not be any of these things:

> Its goals are general rather than specific; it is not primarily problem-oriented but concerned to provide balanced coverage, and its aims are popular and educational. Such relevance as it possesses it gains by its appeal, at the lowest educational level, to the two universal human responses of wonder and concern—that is, wonder about the nature and range of the earth phenomena and concern about the life of those whose circumstances differ from our own.

At higher levels, regional geography

> builds on the less universal, but still strongly developed, faculty which John Betjeman has called "topographic predilection"—attachment to particular places or, even more simply, the recognition that not all places are the same place, and that in that fact lies their interest (Paterson, *op. cit.*, p. 21).

THE GRIGG-BUNGE DEBATE (1966): "THE ONE AND THE ONLY REVOLUTION IN GEOGRAPHY"

The Quantitative Revolution in geography—which, Burton (1963) wrote had reached its culmination during the period from 1957 to 1960—was

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over by early 1960s in the sense that by that time (Burton added) accepted ideas had been overthrown or modified to include new ones, so that the revolutionary ideas had themselves become part of conventional wisdom. Quantitative revolution was claimed to have brought about a radical transformation of the spirit and purpose of geography. It was in the midst of such intellectual ferment that Grigg's paper on the logic of regional systems appeared in the *Annals*, A.A.G. By this time, geography had started moving away from the exceptionalist position of Hettner and Hartshorne, and geographers in ever-increasing numbers were using the general approach of the hypothetico-deductive methodology of science. James Bird (1989, p. 11) has identified June 1966 as the date representing "the last straw, when the last idiographic bastion in geography was overthrown—the destruction of the idea that locations could never be anything but unique". According to Bird, this event of transformation was occasioned by Grigg's attempt to deal with the problem of regionalization on scientific lines.

Grigg maintained that "all parts of the earth's surface are unique", and that "classification and regionalization obscure this fundamental fact"; so that, he added, "All locations are unique by definition, hence whereas location can be a property, it cannot be a differentiating characteristic". Thus, notwithstanding his exposure of similarities between regionalization in geography and the process of classification in the sciences, Grigg's perspective on the region was very much in line with the idiographic-chorological perspective of Hettner and Hartshorne. The disciplinary implication of such a view was that: "if it is held that geography includes the study of location of its data and that 'locations are unique', then geography cannot fully employ the scientific method" (Bird, 1989, p. 12; see also Dikshit, 1994, Chapter 12).

Commenting upon Grigg's paper, Bunge asserted that "locations are not unique", and that locations are indeed "general" and they are "comparable" as the frequent use of terms such as "near", "far", "close", "distant" and "adjacent" would show. These terms emphasize "relativity of location" which implies their comparability. Clarifying the point further, Bunge stated that geographical locations are unique only in the sense that

> no two things in the real world are exactly alike. To admit that no two things are identical, that is, have everything in common, in no way contradicts the statement that these objects may have much in common;

and added that

> science is the deadly enemy of uniqueness (Bunge, *Annals*, A.A.G., June 1966, pp. 375-376).

In his response to Bunge's comment, Grigg (1966), while still insisting on the essential uniqueness of locations, conceded, nevertheless, that "locations are essentially relative". Thus, according to Bird (1989, pp. 12-13):

> Here was encapsulated the one and the only Revolution in geography, because the data studied were henceforth not held to be always discretely

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differentiated in space and possessed of unavoidable qualities of total uniqueness.... June 1966 was the apogee of the view that geography could employ the methods of science because there was no longer any inherent quality in its data that prevented it from so doing... [Bunge's] 1966 commentary...symbolized the one and the only revolutionary change, for henceforth it would be a case of constant revision [in the true spirit of science].

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9

The Historical Explanation in Geography

THE ROLE OF TIME AND GENESIS IN GEOGRAPHY

A close relationship between history and geography has long been recognized; for according to Heylyn (1621): "As Geographie without Histoire has life and motione but at randome, and unstable: so Histoire without Geographie like a dead caracasse hath neither life nor motion at all". However, owing to the fact that throughout the twentieth century academic geography has remained dominated by a non-temporal regional approach patterned upon the Kantian view of geography, which scholars at that time had interpreted to mean that geography and history are methodologically different from the other sciences in that the two are peculiarly concerned with the study of the unique and the particular—and that unlike the systematic sciences, geography (like history) is a discipline defined in terms of the method of study rather than by the subject matter studied and analysed: History analyses facts as they are related through time; whereas geography is concerned with the study of phenomena related across space. Geographers viewed the two disciplines as separate from and unrelated to each other. This so-called regionalist/exceptionalist view of geography, pioneered in Germany by Hettner in the beginning of the twentieth century, had through Hartshorne's *Nature of Geography* (1939) become the dominant concept of the discipline in the English-speaking world until well after the Second World War. Paraphrasing Hettner, Hartshorne (1939, p. 184) wrote:

> geography is a field of learning for which "time in general steps into the background...geography does not follow the course of time as such... but lays a limited cross-section through a particular point of time and draws on temporal development only to explain the situation in the time chosen". This one particular time should be short enough so that within it there are no major changes disrupting the cross-section.... "Geography requires the genetic concept but it may not become history".

Contemporary geographers as regional analysts interpreted this line of difference between history and geography, between space and time, rather rigidly.

The legacy of such an interpretation of Kant's view of the classification of sciences and the place of geography in it, was that:

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1. Geography began to be treated as an autonomous discipline, a branch of knowledge that pursued a course of development separate from (and in isolation from) the other fields of knowledge. Such a notion of science and geography was largely responsible for the failure of geography to develop close links with the other branches of knowledge.

2. Geography as a discipline began to be identified with an exclusive concern with space (the earth's surface); a concern which, under Hettner and Hartshorne, had concretized into an exclusive focus on the study of regions in terms of *areal differentiation.*

3. Geography and history came to be regarded as two entirely unrelated and fully autonomous disciplines. There was, therefore, an inevitable parting of ways between time and space, and between region and process so that geography, in the first half of the twentieth century, and still later, neglected time.

Beginning with Schaefer's (1953) paper, the Hettner-Hartshorne view of geography as chorology focused on the study of areal differentiation, was branded as the "exceptionalist" view of the discipline, one that encouraged idiography and thereby led the discipline away from the path of theory and generalization, the basic purpose of all sciences. Schaefer's paper had appeared at a time when there was a general rise in scientific temper, so that Schaefer's plea in favour of establishing geography as preeminently the science of spatial analysis in search of pattern laws had fallen on sympathetic ears. The new generation of geographers had become disenchanted with the regional paradigm in geography—focused on "areal analysis", and, therefore, essentially descriptive in approach. By the mid-1950s, the regional paradigm in geography began to be abandoned in favour of geography as "spatial analysis". Such a shift in perspective involved change in emphasis from *area* to *space,* from *description* to *analysis,* and from the *idiographic* to the *nomothetic* perspective. It also involved changeover to the scientific methodology in the form of increased recourse to the quantitative mode of analysis. The new geographers turned spatial scientists, in the 1960s, "focused upon static patterns. The statistical techniques required to operationalize diachronic models are much more complicated than those used in synchronic models, and the power to predict diminishes rapidly with each step through time" (Prince, 1980, p. 230).

Spatial scientists of the1960s regarded the historical method as essentially empirical and idiographic—one concerned with the understanding of unique events and phenomena so that the transition from the regional to the spatial paradigm provided little stimulus to the flowering of the historical/temporal perspective in geography. Schaefer's paper itself had emphasized the nontemporal character of geography. Despite the chorologists and spatial scientists, the importance of historical thinking in geography and the value of the temporal perspective has long been recognised as essential to the understanding of places and landscapes. So long as geographers remain concerned with the study of places—what they are

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like, how they differ from each other, and how one part of the earth space is related to others—they need to know how these places came to be what they are today. A historical perspective may also be required to the understanding of why things are where they are (Smith, 1965). Geographical research often calls for simultaneous application of the functional as well as temporal perspective in the understanding of reality, since the being and the becoming of places are intimately interrelated.

Clarifying his methodological stand in regard to "Time and Genesis in Geography" (under the chorological persuasion, which had contributed to restricting the study of regions to the "present"), Hartshorne (1959, pp. 82–84) had distinguished four different ways in which the study of time is of concern to the geographer:

> 1. The cross-section which geography cuts through the dimension of time must...have certain thickness, or duration, to provide a representative picture of the existing situations. It is consistent with common usage to refer to such period as "the present" although even the last immediate moment was in fact in the past.

(How far back in history one needs to go shall depend on the nature of the problem (or the phenomenon) being investigated.)

2. Geography is the study of both "being" as well as "becoming" of places on the earth's surface as the world of man. Since the phenomena that geographers study are often subject to cumulative changes over time:

> The full description of the geography of an area "as it is"...must include description of the direction and rapidity of change. To determine present trends requires examination of the course of change over a period of the past commonly longer than that required to measure the other characteristics of the present.

3. In geography we are often required to study phenomena which are results of the relationships established some time in the past when at least some of the phenomena were quite different in character. Geographers are, therefore, required to use historical materials in order that the present-day character and distributional patterns of the objects being studied are placed in proper perspective. Indeed, Ritter had underlined the value of the historical perspective in geography long ago in his celebrated lecture on "The Historical Element in Geography". Thus, according to Hartshorne:

> The so-called static theory, that geography could explain existing phenomena solely in terms of contemporary conditions, is an invention of the critics who attack it. In fighting this windmill they lose sight of the valid issues: the question of how far back in the past it is necessary or desirable to investigate the development of the present features, and the degree to which geographic studies of the present should be organized in historical sequence.

4. In regard to genetic studies in geography, Hartshorne wrote:

> A somewhat different issue is raised by studies which seek to explain, not the integration of phenomena, but the origin and development of

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> individual features in present geography of an area. Such genetic studies, reaching infinitely back in time, focus on the causes of development of particular kinds of features, and are considered by many as more closely related to the systematic sciences or to history than to geography.

(This may, however, be no valid reason for excluding such studies from the domain of geography since the geographer, like any other scientist, should be free to contribute his share to the extension of the frontiers of knowledge; and disciplinary boundaries should not be allowed to create barriers in this regard. As a professional, however, the geographer must keep his vision closely focused on space relations.)

Finally, geographers study the past not only as "the key to the present", but also (and more importantly) in terms of the geographic content of each past period since:

> Each past period had its own present geography, and the comparative study of different geographies through successive periods of time depicts the changing geography of an area. Thereby the historical dimension of time is combined with dimension of space....

wrote Hartshorne (1959) who regarded such studies to constitute the domain of historical geography as a special branch of geography.

MAJOR AREAS OF TEMPORAL EXPLANATION IN GEOGRAPHY

The main areas of geographic research specifically involving the study of change through time are: cultural geography, innovation diffusion, time geography, and the process-form approach to explanation. A brief introduction to each is given below:

1. In cultural geography the principal area of interest where historical explanation plays a dominant role is the study of the landscape. The cultural landscape in any area embodies "a heritage of many eras of natural evolution and many generations of human effort". Indeed, "behind most cultural areas of today lies a long succession of different cultures and cultural development" (Wagner and Mikesell, 1962, pp. 11–13). The study of the cultural landscape was a major focus of study in human geography in North America under the leadership of Carl Sauer at the University of California at Berkeley. The historical perspective was so deeply involved in the study of landscape by Sauer and the members of his Berkeley School, that "the study of landscape might be most correctly identified as cultural-historical geography" (Norton, 1984, p. 21).

2. The study of innovation diffusion—which may be defined as the spread of any phenomenon over space through time—was an important component of traditional cultural geography. This theme of study received special attention, and experienced considerable development in research, during the 1960s under the influence of the quantitative revolution in geography and following the enshrining of spatial analysis as the dominant focus in geography. Diffusion was regarded as one of the few primitive

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processes of concern to spatial analysis and was found to be vitally important to the construction of a general theory of landscape evolution (Morrill, 1970). Diffusion studies became a major focus in study and research in the new geography as spatial science under the leadership of the Swedish geographer, Hagerstrand. It included a wide variety of topics of research. Such studies conceptualized the adoption of innovation as the outcome of a learning process operating through time. Such a concept was in close accord with the current research orientation in rural sociology (which had served as a major source of inspiration to innovation-diffusion research in human geography). A major problem in diffusion research was related to the role of time, and the continually changing role of each component variable through time (Brown and Moore, 1969, p. 148), so that "innovation of diffusion analyses represent perhaps the most successful incorporation of time into geography outside of historical geography" (Norton, 1984, pp. 22-23). Most of these studies adopted Hagerstrand's simulation model of diffusion process, and were based on the premise that all spatial forms are, in some degree, dependent on previous forms so that diffusion studies were able to focus attention on the study of *process* in geography.

3. Time geography relates to analyses of space-time patterns and processes which result when individuals and groups are seen as drawing upon time and space as resources essential to the realization of particular projects or objectives. The time geography research was closely allied to (and derived its basic inspiration from) Hagerstrand's earlier work on diffusion as a space-time process. It was first adopted by his associates at the University of Lund in the 1960s. Students of time geography argued that different projects compete with each other for the available time-space paths, and that the collective outcome is the result of a multifaceted competition in which time and space play the pivotal role. Thrift (1977) identified three varieties of time: biological, psychological, and socio-ecological. He also focused on the relationships of these respectively to social behaviour, learning process, and temporal organization of society. However, according to Norton (1984) "it appears that the basic ideas of time-geography have little to contribute to historical geography".

4. Dissatisfaction with static theories and static explanations in the study of present-day forms and patterns led to the increased demand on dynamic theories emphasizing upon the processes through which the present-day patterns had evolved. Geographers were now increasingly convinced that "reference to spatial process is inescapable in any analysis of spatial structure" (Abler, Adams, and Gould, 1971, p. 60), and it was generally agreed that one determinant of present location is the past location of the phenomenon concerned (Morrill, 1970; Pred, 1969).

To begin with, attempts to relate process and form involved, first, a description of a given pattern (i.e., form) and then an effort to explain the process through the analysis of the resultant pattern. But it was soon realized that generalizing about process through the analysis of form is an uncertain

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route to knowledge (Berry, 1973, p. 3). A given form may result from a number of different processes. Hence, analysis of form cannot lead to identification of the complete set of causal processes involved. Geographers, therefore, rejected the procedure of drawing inferences about process through form, since the reasoning from form to process essentially involved reasoning about the cause from the examination of the effect.

Thus, the most useful form of temporal explanation involves approaching the explanation of form through the analysis of process. Chronologically, process precedes form, but the major problem is how to arrive at the initial understanding of the underlying process. A typical procedure in this regard is to develop the concept about the process of development in a given case on the basis of the available explanatory theory, in combination with the relevant empirical analysis, and possibly also form analysis: "On the basis of information from these three sources, generalizations are derived and are organized into simplification of the process. This simplification or model is used to generate forms, often by means of simulation. The simulated are compared to the known outcomes and an assessment of the model is possible. Such a procedure is typically stochastic. This type of analysis closely accords with the scientific method as defined by Kemeny (1959); induction, deduction and verification" (Norton, 1984, p. 24).

In this type of analysis, process is interpreted as a set of rules which transform map forms through time (Norton, 1984, p. 26):

> Processes comprise variables, indicating their interaction with one another, their changing emphasis through time and relative importance, in an analysis which is focusing on process.

Nature and Development of Historical Geography

Historical geography is essentially the geography of the past. Three broad phases in the development of historical geography in the Anglo-American realm have been identified: The first comprised the period in which historical geography was seen as central to the rest of geography, so that Darby (1953) regarded it, alongside geomorphology, as one of the main pillars of geography. Indeed, as Gregory (1981) explained:

> Both these subdisciplines found their field in the study of the landscape, and while the methodology established by Darby was concerned to differentiate historical geography from the other historical disciplines through a focus on assembling sequences of cross-sections to depict the evolution of rural landscape (e.g., Darby, 1951), the closure could not be, and in fact never was complete.

The most characteristic feature of the geographical studies of the past (which emphasized the distinction between historical geography and other forms of historical analysis) was a predilection for cartographic representation of individual historical sources, of which "Darby's own series of *Domesday Geographies of England* is perhaps the finest example". Reconstruction of

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past landscapes, as in the case of landscape geographies of the Berkeley School, was another stream of this kind of historical geography. Both in Britain as well as North America, historical geography in this phase was characterized by a "resolute empiricism" which assumed that observational statements are the only ones which make direct inference to reality, and that they can be declared true or false without reference to truth or falsity of any theoretical statements.

Such an empiricism was greatly out of tune with the new geography as a spatial science in the 1960s, increasingly focused on formulating theories of spatial organization based on the analysis of idealized landscapes shaped by the universal dictates of an abstract spatial geometry. The functionalist perspective of new geography as a spatial science neglected historicity and the historical mode of explanation, owing to its overwhelming focus on spatial form, which contributed to the avoidance of considerations of the historical processes involved. Thus, as one commentator put it, during the 1960s

> historical geography was pitched through the eye of the storm over exceptionalism, eventually to find itself becalmed on the periphery of the subject and assigned at best a subordinate role as a testing ground for models whose essential purchase was on the present and the future (Gregory, 1981, p. 147).

The 1960s represented a period of decline for historical geography as a field of research. Many historical geographers now busied themselves in exploring the possibilities opened up by the new concepts and techniques of geography as the spatial science of the earth—techniques such as nearest neighbour analysis, graph theory, central place theory, regression models, and multivariate techniques. For many historical geographers, however, this clearly represented "a denial of the classical conception of their subdiscipline, a reduction of its richness and complexity to a one dimensional contemplation of planes and point patterns" (Gregory, 1981, p. 148). Most students of historical geography, therefore, continued to pursue the established preoccupations of the subdiscipline.

As Gregory noted, owing to the fact that British historical geographers were more accustomed to the essentially cartographic analysis of their data, the new concern with spatial structures was less antipathic to historical geography in Britain. Thus it was natural that the most forceful attack on the "neo-classical" spatial-structure orientation in the study of historical geography should come from North America. In an article published in 1971, R.C. Harris argued that historical geography is not a science of spatial relations. Historical geography, Harris insisted, is more properly concerned with regional synthesis; and regional synthesis, Harris and other historical geographers maintained, could be pursued on a level very different from the old Hartshornean orthodoxy. The myth of the apparent dualism between process and pattern (Blaut, 1961), and between genetic and functional studies (Smith, 1965) was already exploded, so that by the late 1960s many historical geographers were attempting studies in regional synthesis making use of

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the concepts and techniques of systems analysis. Research output in this direction included Pred (1969, 1973), Wrigley (1965), Harvey (1967), and Langton (1972, 1979).

Harris's critique, however, was as much an affirmation of idealism in historical geography as it was a rejection of conventional space science. Harris referred to the need for the "confrontation between scientific and humanistic cultures" in historical geography. Attempts at reconciliation between the two viewpoints in historical geography were attempted by Jakle (1971) and Prince (1971). Jakle recommended consideration of "historical contexts, especially that of the behavioural environment" in the building of models of the past spatial change; while Prince pleaded in favour of attention to "real, imagined and abstract worlds" of the past. In the 1970s, therefore, historical geography had experienced a kind of new beginning (Baker, 1972a, 1972b, 1978, 1979), a period in which the subfield was witnessing the slow emergence of a *historically informed regional geography* which,

> while now accepting the contribution which quantitative methods can make to analyses of space-time data matrices, is at the same time breaking out from the planar prison to recover an anterior humanism and a traditional environmentalism.... The first indicates a *rapprochement* with the concerns of social and economic history and historical anthropology through (in particular) a recognition of the reciprocal relations between human agency and social structure entailed in the concepts of class and community.... The second..., environmentalism, gestures towards an increasing cooperation between historical geographers and palaeobotanists, historical climatologists, and archaeologists in reconstructing the cultural ecology of past landscapes and in determining the significance of environmental change in human history (Gregory, 1981, p. 149).

The most far-reaching gain of these developments in historical geography (and the historical geographer's interdisciplinary discourse) has been a general recognition of the importance of historical specificity in the explanation of phenomena in human geography, and re-enshrining of the retrospective approach, i.e., the study of the past for the light it throws on the present, in the study of contemporary human geography.

Approaches to the Study of Historical Geography

In the course of the discussion on aims and methods of historical geography Smith (1965) listed four different approaches to the study of historical geography. These are:

- The operation of the geographical factor in history;
- The evolution of the cultural landscape;
- Reconstruction of past geographies; and
- The study of geographical change through time.

He underlined, however, that

> each of the four concepts... shade into the other; many studies would be difficult to classify under no more than one of the headings given above.

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In regard to the operation of the geographical factor in history, Smith noted that

> it suggests a view of causation by which it was thought that the phenomena could best be understood by studying, listing and classifying the operation of particular groups of factors and effects, each group producing its own particular pattern of determinism: social, economic, technological determinisms thus take their place side by side with the geographical determinism.

Indeed, so long as

> geography was seen to be essentially concerned with the relationship of man with his environment, geographers could clearly search for materials in the records of the past just as logically as in those of the present for examples of "responses" to physical environment which could be catalogued as a stage enroute to the formation of geographical laws (Smith, *op. cit.*, pp. 122 and 123).

As Sauer (1941) put it, at its worst, this type of historical geography may be nothing more than the task of "adding the missing environmental notations to the work of historians".

The concept of historical geography as the study of the changing landscape was an obvious extension of the wider concept of geography as the study of landscapes (Landschaften). Such a concept of the subfield had led to the widely subscribed view that historical geography must concern itself with the study of the process through which human groups have over time succeeded in transforming the area of their habitance from a mere piece of territory into a cultural landscape reflecting their thoughts and way of life. This approach to historical geography was given form and substance by Darby's attempt at systematization of the major items to be included in the study of the evolution of the landscape in Britain. These comprised the clearing of the woodland; the drainage of the marsh; the reclamation of the heath; and the changing agricultural, industrial and urban landscape. In 1951 Darby had attempted a study of "The Changing English Landscape" on lines somewhat similar to Wooldridge's study of the physical landscape of Britain. Such an approach to historical geography had its apparent shortcomings. As Smith (1965, p. 125) noted:

> part of the price which is paid for this rediscovery of unity of geography by way of landscape studies is the danger that man may be deposed from a central position in the study of geography and regarded as no more than an anonymous automaton whose task is to produce the visible features of the landscape, as impersonally as the processes responsible for soil creep.

The reconstruction of past geographies was by far the most orthodox and unexceptionable view of historical geography. Mackinder subscribed to this view of the subfield, so that historical geography was defined as the branch of geography specifically concerned with the study and analysis of the historical present. Most of the more important studies in historical

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geography (outside the Berkeley School) belonged to this type. Darby, Ralph Brown, Braudel, Whittlesey, and East all viewed historical geography in this way. The rationale of this approach was aptly summarized by Mitchell (1954, cited in Norton, 1984):

> Some elements of geographical design that develop in response to passing conditions are extremely stable in their form or long lasting in their effects, and the understanding of the present demands the study of geography of the period of their establishment and development.

The methodological foundation of this approach essentially lay in the separatist view of the division of knowledge between chronological (genetic) and chorological (areal functional) studies, so that this approach to historical geography was in line with the current (1920 to 1950) focus on geography as the study of areal differentiation. According to this view of the discipline, geography remained essentially concerned with the study of areal functional relationships between the phenomena of diverse origins existing together in particular segments of earth space. This concern was logically stretched back to the study of "past periods" each of which had its "present geography". Maintaining this fundamental disciplinary division between the genetic and the chorological perspectives, Whittlesey (1929) recommended that historical geography "must not be concerned with the processes of development. It describes and explains the geographical interrelationships for a fixed period". Viewed as the reconstruction of the regional pictures of past periods by means of the methods and techniques of geography as chorology, historical geography was easily justified as methodologically quite distinct from any kind of history of the same place during the same period.

However, reconstruction of past geographies is no longer the part of any major methodological debate. It has come to be regarded as one of the several ways of looking at the past in geography, and it continues to be pursued by many. As one commentator put it,

> With the resolution or simple removal, of the methodological issue there is no longer a need to justify such studies *vis-a-vis* alternative approaches; rather such studies are appropriate where required by the research problem or data (Norton, 1984, p. 31).

Some scholars have, however, disputed the claim of the "period pictures of the past" as a valid part of historical geography. Guelke (1982, pp. 192-193) found no logical basis for differentiation of historical geography from history. According to him the notion that "historical" is synonymous with "the past" is a major misconception. A historical study is by definition concerned with change. The geographical study of a past period is, therefore, not necessarily historical, even if the study is based on archival material. In Guelke's view studies like Ralph Brown's *Mirror for Americans* should be classified as contemporary regional geography rather than historical geography, since the concern with "past change" is a necessary element in any historical study.

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The most ardent advocate of the concept of historical geography as "geographical change through time" was A.H. Clark. He defined historical geography as "the study of the past circumstances of, or change in, phenomena of concern to geography" (Clark, 1954). A little earlier, British geographer Ogilvie (1952) had underlined that the discussion of cause-and-effect relationship necessitated a search for origins; and the knowledge of previous evolution is important to the understanding of the existing landscape; so that in regional geography we need to take into consideration the past developments. Such a dynamic view of historical geography as the study of historical process received considerable support from Platt's influential paper on "A Review of Regional Geography" (1957) wherein geography was defined as "the science of regional process patterns of dynamic space relationships".

The approach to historical geography as the study of change through time does sometimes pose the problem of distinction between what is history and what is geography; but as Smith (1965) wrote:

> The problem itself is often artificial and arid, since what matters is the contribution made to knowledge, but it is frequently helpful to bear in mind the rule of thumb that geographers are essentially concerned with places and what they are like, whether in the past or the present.

More recently Guelke (1982) saw "no logical basis for differentiating historical geography from history".

Such a view of historical geography emphasizes on geographical change, which calls for attention to time period as well as to the process of change. This became the dominant view of historical geography from the mid-1950s. The reason was twofold:

> First, as an approach, a means of analysis, it proved much less restrictive than the somewhat contrived past geography. Second, it is directly concerned with causes or processes, and is, therefore, by definition more oriented toward explanation (Norton, 1984, p. 32).

Another approach to the study of historical geography may be defined as the "study of the present" with a view to utilizing the present-day landscape as a means to the understanding of the past through a retrogressive approach—a term that had gained currency from Maitland's *Domesday Book and Beyond* (1897), and was popularised through the work of Mark Bloch (1954) who insisted that the analysis of past landscapes demands prior analysis of the present landscape. Establishing analogy between history and a film, Bloch argued that "only the last picture remains quite clear" so that "in order to reconstruct the faded features of the others" it is first necessary "to unwind the spool in the opposite direction from that in which the picture was taken".

The study of the theme of the past in the present also includes the study of relict features of the present landscape without any reference to the relevant past landscapes. It is maintained that

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> For the study of relict features a retrospective approach may be appropriate for it involves studies of the past as a means of elucidating the present conditions with the focus being on the present (Norton, 1984, p. 34).

Also included within this theme are studies pertaining to conservation and preservation of the past landscape features.

What is Historical Geography?

In a wide-ranging review of the field of historical geography Norton (1984) posed the question: "What is Historical Geography?", and concluded that the review of recent literature shows that the question "has not been answered", and that recent developments "emphasize continuing diversity of the field". In an article entitled: "In the Pursuit of Historical Geography and other Wild Geese" Zelinsky (1973) questioned the status of historical geography as a separate field of study. He asserted that there was no logical basis of historical geography, and that historical geographers could be better described by other terms, since all geography is spatial, and the historical geographer does not ask a set of questions distinct from those of the wider body of researchers pursuing different systematic branches of geography.

This was by no means a novel charge against historical geography as a branch study. Way back in 1962, Clark had asserted that "the concept of a separate field of 'historical geography' may be one of our esoteric taxonomic myths". Jakle (1974) responding to Zelinsky's paper proposed to redefine historical geography as the study of the geographic past. Goldenberg (1972) in his article "About the place of historical geography in the system sciences" stated that:

> the apparent conflict of views and definitions of the concept of "historical geography" can be resolved only on the condition of recognizing a unified historical geography (both "geographical" and "historical") as an independent scientific discipline located in the transition zone between geography and history.

Ward (1975) argued that the source of controversy lay in the lack of a new and commonly accepted methodology in historical geography. Gregory (1976) drew attention to the inadequacy of explanatory structures, and lamented that "Despite so many bugle calls, however, there have been few changes in historical geography". More recently, the emerging convergence between historical geographers and social and economic historians and historical anthropologists on the one hand, and between historical geographers and palaeobotanists, historical climatologists, and archaeologists on the other, has been found as a major source of interdisciplinary integration, evidenced by the increasing methodological convergence between historical geography and the rest of the subject, as also the general recognition given by geographers to the important role played by *historical specificity* in the explanation and understanding of problems in human geography. In a review of historical geography in Britain in the 1970s, Butlin (1982) wrote: "as far as the bulk of published work is concerned there is not a great

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amount of evidence that the new ideas have penetrated very far". Butlin thought that

> what is badly needed is debate, between geographers and their colleagues from other disciplines, and between geographers and geographers, for the literature of British historical geography shows little evidence of passionate debate on critical issues.

Time and space are so intimately intertwined that the relevance of the historical and geographical perspectives to either of the disciplines—history and geography—need to be continuously focused and debated.

THREE REALMS OF HISTORICAL GEOGRAPHY: REAL, IMAGINED, AND ABSTRACT WORLDS OF THE PAST

In a long review essay written with a view to indicating new approaches to knowledge of the past, to see if past investigations on the subject could contribute to the enlargement of the work of the non-historical specialists, Prince (1971) stated that it is helpful to think of the ideas about the past as deriving from three arbitrarily defined realms of knowledge, namely, the real world of the past, the view of the world in the past as held by contemporary (or later) observers, and models of abstract worlds of the past created by theoreticians. The first realm, that is, the external world of features that actually existed in the past, and of the events that can be verified to have actually taken place at the time, has until recently been the chief object of study in historical geography. More recently, many historical geographers have tried to reconstruct and rediscover the past worlds as they were perceived by the contemporaries who saw and interpreted reality around them according to their culturally acquired preferences, prejudices (or beliefs) and the assumed needs of society. Thus, as Bloch (1954) noted, "in the last analysis, it is human consciousness that is the subject matter of history. The interrelations, confusions and infections of human consciousness are, for history, reality itself". One of the earliest geographical contributions of this type was of Ralph Brown's *Mirror for Americans: Likeness of Eastern Seaboard, 1810* (1943). Few studies of a past period for any other region have so successfully and so completely captured the perceptions of the contemporary writers about their habitat and its environment.

Neither the empirical studies of the real worlds of the past, nor the behavioural studies of the imagined worlds of the past provide a full understanding of how phenomena were organized in space in that period, how the areal aggregate functioned, or how they have got transformed from one stage of development to the other. This is, according to Prince, the third realm of inquiry into the past, the realm which is "being invented into the minds of the theoretical geographers".

> Increasingly the possibility emerges that models may be used to depict a large number of changing abstract landscapes against which their real world counterparts may be measured and more fully understood. The

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> effects of the speed of new ideas or techniques, or the decline of old economies, or the breakdown of old social orders or political institutions may be explored or reconnoitred by fabricating counterfactual situations—comparing what actually happened with what would have happened under alternative situations (Prince, 1971, p. 5).

The explicit introduction of the study of both perceived and abstract worlds within the purview of historical geography was obviously a reflection of the current developments in human geography in the 1960s when this field of study had begun increasingly to be viewed as the spatial science of the earth's surface. Human geographers in increasing numbers began to make use of the behavioural perspectives in their research. However, "Despite significant growth in both these categories it is the first category, that of real world of the past, which has dominated historical geography" (Norton, *op. cit.*).

THE NEED FOR DISTINGUISHING BETWEEN THE ROLE OF THE PAST IN NATURE AND CULTURE: COLLINGWOOD'S THEORY OF HISTORICAL KNOWING

Much of the academic geography in modern times had derived its inspiration and sustenance from a severely natural science tradition of the Victorian era. Most of the philosophical ideas in geography were derived from the natural sciences, some directly and the others indirectly. This was generally true of all branches of geography, historical geography included. As Gregory wrote:

> mid-twentieth century geography formalized the ideas of its Victorian forebears.... What was distinctive about it was that the earlier emphasis on the ontological emphasis on the natural world was replaced by the epistemological primacy of the natural sciences. This implied tacit allegiance to a positivist philosophy of science, which in its original Comtean form grounded knowledge in the direct experience of an immediate reality (Gregory, 1978, pp. 19–20).

Such a philosophical stance contributed to the geographers' neglect of the role of the past in the present geography of places, and thereby led to a distorted perspective on history. As Collingwood (1946) noted, history is not concerned with offering explanations of events in the style of the natural sciences. History does not seek to provide full causal explanation of an event, it does not attempt to list all the necessary and sufficient conditions for the occurrence of particular events. The historian is more fundamentally concerned with elucidating the historical significance of the event in question. To Collingwood, "All history is the history of thought". He underlined the fundamental distinction between the role played by the past in the phenomena in nature vis-a-vis the nature and organization of man in society. In the natural sciences, "historical" inquiry is concerned essentially with the reconstruction and understanding of the material processes, i.e., the physical and chemical processes involved.

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In the natural sciences, therefore, the present is used as a key to the past, since the laws of nature are universal laws which are assumed to have operated in similar fashion in the past as in the present. Collingwood maintained that the task of the historian (and other students of man's past) is of a very different nature. The primary interest of the historian in the study of the past does not lie in the external manifestations of human activity, but rather in the internal thought that lay behind them. The historian's mode of inquiry is, therefore, very different from that of the natural scientist's. The historian's objective is to understand human activity from the "inside" by rethinking the thoughts of the historical agents of the relevant period. Through such a process of rethinking, the historian is able to create an image of the past in the present. Thus, unlike the geological past, which is dead, the human past is a living past.

Drawing attention to Collingwood's theory of historical knowing, Guelke (1982) noted that Collingwood's ideas provide "an explicitly historical basis on which a stronger historical geography can be built". Guelke maintained that there is no logical basis for differentiating historical geography from history, except that geographers have mainly been concerned with the study of human settlement and land-use. He wrote:

> If all history is the history of thought, all historical geography is the history of thought with a bearing on human activity on the land... In historical geography, the events of interest are those related to human activity on the earth. This activity is dependent, in the first instance, on understanding the physical environment in terms of the human meanings it has. These meanings have changed as human condition has changed and as the knowledge of the environment has expanded. The environment must, therefore, be understood by thinking the thoughts of those who are seeking a living within it.

Guelke maintained that a historical geography patterned on Collingwood's theory of historical knowing can easily adopt an empirical approach to explanation which is helpful in avoiding "mere description" or extreme scientific empiricism, on the one hand, and the non-historical aims of theoretical approaches on the other. To conclude with Guelke:

> A concern with thought permits the historical geographer to explore the meanings of geographical activities in their unique historical settings. This exploration holds out the promise of providing us with valuable insight into the evolution of human society without need of the formal theory that is inseparable in studies of natural phenomena (Guelke, 1982, p. 196).

GEOSOPHY AND HISTORICAL GEOGRAPHY

The foregoing view of historical geography modelled on Collingwood's theory of historical knowing brings the subfield face to face with *geosophy*, which Wright (1947) regarded to be "to geography what historiography is to history, it deals with the nature and expression of geographical knowledge,

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both past and present—with what Whittlesey called 'Man's sense of territorial space' ". Geosophy deals with "geographical ideas both true and false held by all manner of people, accounting for human desires, motives and prejudices". However, Yi-Fu-Tuan (1977) lamented that the history of environmental ideas has many times been studied largely in detachment from the question how, if at all, these ideas guide the course of action, or how they arise out of it. Thus may scholars regard these studies as no more than "catalogues of images: capes and bays geographies of the mind". They, therefore, propose a role for such studies within (but not apart from) historical geography. Indeed, "geosophy" has little value when removed from historical geography; yet it is the most human level on which we can know the past, since every past event is a complex combination of images, concepts and acts, intended and unintended consequences, and environment. To remove images from this context and use them alone to explain an event simply ignores too much of the evidence available to us.

History and geography have often been interpreted as the outcomes of intentional acts, and there is a tendency to play down the importance of unintended and unforeseen consequences, and to ignore the influence exerted by the local environment. Chambers (1982, p. 200) emphasized that

> people are not free to create the world narcissistically as they see it. Conscious *decisions* can be made on the basis of perceptions of the world, but *actions* are played out in the real world. There will be unintended consequences whenever there is discrepancy between the world as perceived [and acted upon] and the world as it is.... The world has been created as much by mistake as by intent, and it is for this reason that to understand the past we need images, acts *and* consequences.

"IDEOLOGY", MARXIST HISTORY AND HISTORICAL GEOGRAPHY

From historical geography to "ideology" (which Chisholm, 1975, defined as the expression of ideas and values which together constitute "a metaphysical system" that is "not amenable to scientific analysis") is but a short step. As Gregory (1978) wrote: ideology in geography is now used increasingly in the Marxist sense to refer to a set of beliefs with which people deceive themselves—a body of unexamined discourse. Projecting a Marxist viewpoint, Anderson (1973) defined ideology as "systems of ideas which give distorted and partial accounts of reality, with the objective and often unintended consequences of serving the interests of a particular social group or class". Baker (1982) has pleaded that historical geography must embrace ideology because:

> there is potential here for a significant *detente*—even the development of *entente cordiale*— between historical geography and contemporary human geography stemming from an increasingly shared concern with geographies viewed historically.

Baker noted that while there has been a general acceptance by historical geographers of the famous aphorism of Darby that all geography is historical

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geography, either actual or potential, there has been scant recognition of the adage of Karl Marx that all history is the history of class struggle. To Baker it appeared that

> Given the richness of the contributions to social history by Marxist historians, the time is long overdue for historical geographers to consider seriously Marxist methods of historical analysis, and to ask to what extent it would be a constructive step to move toward Marxian humanism.

In this regard Baker singled out the following themes:

1. History and historical geography must be viewed as humanism. Both must be, first and last, about people, and only secondly about periods and places. Marx rejected long ago the view of history (i.e., time) as an external force just as geographers are now rejecting space as an autonomous realm. History (and historical geography) are the outcome of the activity of man pursuing his ends, so that:

> The history of mankind is ... always a geography of man's search for roots. The first man is, as it were, the man who invented a boundary to delimit *his* place, and human history is, therefore, a history of boundary-making, maintaining and changing (Samuels, 1978).

2. History is essentially a space specific study of the particular. According to Marx, historical analysis involves reconstructing the system of material production and of productive relations in terms of their tensions, antagonisms and contradictions in each area since it is these which are seen as promoting change. A central theme in Marxist historical analysis is class struggle and changing class consciousness. Such a view of history offers a more sound framework for the study of historical geography by regions. It also allows due appreciation of the perception that the past social groups under reference had of each other. Such an approach to historical geography facilitates integration of the real and the imagined world of the past so that the observer's (the researcher's) and the historical actor's views are duly reconciled. Marx viewed history as specific to particular places. The same is true of historical geography which is "more properly concerned with period and place than with time and space".

3. Place specificity of history, and the study of historical developments in particular places, does not imply that history and historical geography preclude theory and generalization. Far from it, according to the Marxist theory, history involves a fundamental change from feudal, religious and hierarchical societies to capitalist, secular and egalitarian societies. The Marxist conception of history, therefore, calls for a marriage between the empirical and theoretical modes of analysis. There is no contradiction in this position, as the following statement from another commentator would clarify.

> It would be incorrect to hold that no regularity can be expected in the experiential (historical) approach to geographical analysis. Human behaviour is far from being unstructured and quixotic. It is subject to shared responses to common situations. At the same time, individual solutions to situations can be expected, and the study of experience of

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> man in shaping resolutions for problems has two logical concerns: the *commonly shared responses* and the *exceptional acts* (Vance, 1970, p. 140).

Thus the study of both, the particular as well as the general and hence, generalization as well as particularization, are integral to history (and by implication, to historical geography).

4. The Marxist view of history emphasizes that the historical process should be studied in its totality.

> History and geography are quintessentially synthetic disciplines: If the essence of geography is the study of regions, a kind of place synthesis, then the Marxist argument would lend support to the view that all geography must be historical in its perspective (Baker, 1981, p. 242).

5. The fundamental significance of a holistic concept of history, and of historical geography, lies in its inclusion not merely of the past and the present but also of the future. The concept of history as a process of humanization incorporates within it the idea of progress.

> For the Marxist, there are two criteria of progress: whether it increases man's power over nature and diminishes man's power over men. Historical geographers should, therefore, focus their attention not only on man's developing control over nature but also his developing cooperation with or domination of men. Progress needs to be viewed not only in terms of material production but also of human emancipation.... The Marxist approach sees the writing of history as an integral part of the making of history (Baker, 1981, pp. 242-243).

> As a holistic and humanistic endeavour, history asks questions of the past—as Lucien Febvre puts it—in terms of humanity's needs of today. So the historical geography which we write needs to make sense, to have meaning, for the present (Baker, 1984).

> [Thus], a central task of historical geography is to clarify the ways in which human history *is instantiated in human geography*: to show how spatial structures are at once the condition and consequence of social practice (Baker and Gregory, 1984, pp. 188-189).

But there is scope for disagreement on this point. According to Harris (1978), the historical mind is

> contextual, not law finding..., the historical mind is dubious that there are overarching laws to explain the general patterns of human life.

The historical mind, according to this author,

> is acutely sensitive to the motives behind action, contextual in its approach to understanding motives, and skeptical that covering laws can provide a full explanation for the motivation behind particular events (Harris, 1978, pp. 126-127).

Harris agreed, however, that

> The historical mind readily accommodates some forms of Marxism but no abstract theories of spatial analysis (Harris, *op. cit.*, p. 134).

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Historical Geography: A New Resurgence

As Harris (1978, p. 134) wrote:

> some of the historical geographers' most central predilections—so widely disparaged by the spatial analysts of the 1960s—suddenly have a large geographical constituency To be sure, the routes of convergence are quite different. The humanists have not discovered historical geography so much as phenomenology, structuralism, Marxism, or even theology.... But there is now a wide awareness of the impossibility of separating facts, values, and of the importance of contextual studies.

The most important point to remember is that "There is no useful disciplinary line separating present from past, space from time" (Harris, 1978, p. 136).

Clearly visible since the 1980s is a new sense of *historicity* now abroad within the discipline, so that the more recent methodological writings in geography "have been characterized by a determined break with functionalism. Discussions of idealism and a phenomenologically informed humanism, of the limitation of structuralism and the construction of a realist social science, and their conjunction in various models of structuration: All these, despite their differences, signal a profound departure from the deeply sedimented partitions between 'cross section' and 'vertical theme' or between 'synchronic' and 'diachronic'"; so that historical geography is poised to regain the central place it had within the wider subject when Darby (1953) wrote that classical essay "On the relations between history and geography" half a century ago.

Development of Historical Geography as an Autonomous Branch of Human Geography, 1930s to 1980s

As the human geography of the past, historical geography has a long history dating back to the last quarter of the nineteenth century when geography had got formally recognized as a university level discipline. The topics taught in university departments of geography then included the history of the Holy Land and of explorations and discoveries as well as changes in the location of political boundaries. However, during this period historical geography was by no means a distinct branch of the geographical science. As such, the origins of modern historical geography are traced back to the 1930s when the study of the geography of the past became, in the words of Darby (1983), a "self-conscious discipline".

In its meaning as the geography of the past, historical geography has been all through pursued by two sets of scholars: One set consists of researchers who regard themselves as the practitioners of a branch discipline with a distinct identity of its own; and the other consists of researchers who invoke the knowledge of the past in the course of comprehending present-day relations in regard to the problem or the phenomenon under investigation. Both types of studies have contributed significantly to the study of human geography of the past, so that developments in historical

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geography, in the broadest sense of the term, may, following Overton (1994), be divided into three distinct phases:

1. From the 1930s to the 1960s, when historical geography was viewed, alongside geomorphology as central to geography as a discipline so that most studies in regional geography included a historical component as an essential preface to the discussion of the present-day landscape. However, the tradition in the study of historical geography in North America differed considerably from that in Britain. The historical regional geographies as pursued by the Berkeley School, were focused on reconstruction of the cultural landscapes (Williams, 1983). In Britain, interest in the study of landscape development was by no means absent, the more common pursuit of historical geography consisted of recreating the geographies of the past in the form of historical cross sections (or period pictures). This consisted of cartographic reconstructions based on descriptions contained in individual historical sources. Darby's series on Domesday England (1952–1977) stands out as one of the earliest and by far the most celebrated example. This type of historical geographies generally conformed to Gilbert's (1932) dictum, according to which,

> Historical geography should confine itself to a *descriptive* geographical account of a region at some period and should *not* endeavour to make the explanation of historical events its main objective.

2. In the post-quantitative Revolution phase during the late 1960s and 1970s, the central role assigned to historical geography in the study of human geography was challenged by the new crop revolutionary geographers, so that historical geography (like political geography during the same period) was transformed into a marginal sector of geographical research. In the first place, the descriptive approach of the earlier studies in historical geography was out of tune with the current focus on analysis and explanation by means of overarching theories and generalizations. Besides the subfield as then pursued and conceived, was not amenable to the current methodology of quantitative analysis. In general, the historical geographers of that period had lacked the necessary equipment to pursue the new methodology. The net outcome was that the role of the past in the understanding of the present-day phenomena and relations was considered inconsequential, owing in the main to the overwhelming focus of the new geography as spatial analysis on "functionalism", and on the geometries of space, both of which were opposed to the historical mode of explanation. Under such a changed perspective in human geography, while some historical geographers had continued to pursue the subfield as before—though their studies were now becoming increasingly analytical in approach, the more fashion-conscious historical geographers began to incorporate new techniques of quantitative-statistical analysis in their work. Side by side, the disciplinary isolation of historical geography was slowly broken, particularly following Baker's (1972a, 1972b,) call to fellow historical geographers to interact increasingly with the social and economic historians, and historical

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anthropologists who were pursuing related problems. This interaction became the source of many fresh ideas and conceptual breakthroughs.

3. The post-Spatial Science phase circa 1980. The mounting dissatisfaction with the post-Quantitative Revolution human geography focused on the search for pattern laws of behaviour in space, now led to the third (and current) phase of development in historical geography. The revival of historical geography as a lively sector of geographical research was brought about by two related developments: (a) The rise of historical materialism in the social science discourse which contributed to bringing history to the forefront in the understanding of the present-day societal relations. (b) The rise of the humanistic perspective (which incorporated "idealism" as a related premise, one which seeks to understand the development of the earth's cultural landscapes by uncovering the thought that lies behind them, Guelke, 1984) contributed to transform human geography once again into a man-centred study. But, as always, historical geographers continue to comprise a small community of researchers, so that the subfield continues to be a "dangerously weak field" of study. Outside the formal subfield of historical geography, human geographers in general are now according a more central role to historical explanation in geographical explanation.

Current research continues the old established traditions, though there are some clear departures (Earle, 1989). These include: research on themes such as the geography of language (Withers, 1984) and geography of madness (Philo, 1989). According to one commentator, "For the first time in its history, the discipline of geography, with an essential contribution from historical geography, is taking a lead in theory building for the social sciences as a whole" (Overton, 1994). As Overton noted: "Perhaps the most significant contribution of historical geography to the discipline as a whole is the construction of an explicit social theory within geography (Harris, 1991)". Thus, during the last decade or so "the long debilating separation of geography from history, and more broadly, the social sciences, has begun to be overcome" (Genovese and Hochberg, 1989).

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10

Impact of Evolutionary Biology on Geographical Thought: Organization and Ecosystem as Geographical Models

Much of geographical work over the past hundred years has been inspired by the evolutionary theory about the origins and development of biological species most particularly by the ideas of Charles Darwin (1809–1882), whose book *The Origin of Species* (1859) had marked a great divide in the history of ideas. Most people today tend to associate the idea of evolution as solely the contribution of Darwin. However, like all great ideas that changed the course of history, the idea of evolution also had its antecedents in the earlier literature on the subject, in biology as well as in other fields of knowledge, most specifically in geology It is logical that we briefly recount the antecedents of the theory of evolution before taking up a review of Darwin's theory and its impact on geographical work.

With a view to tracing the antecedants of Darwin's theory some students have gone far back to the ancient Greeks for statements that indicated the possibility that species of living organisms in nature could record changes over long periods of time. But this certainly is too far-fetched. It is true though that this idea had engaged the attention of many a scientist since the time of Buffon (1707–1788) and Lamarck (1744–1829), since the last quarter of the 18th century. Eighteenth century geologists James Hutton (1726–1797) and William Smith (1769–1839) had provided clear conceptual leads without which Darwin's own contribution might have been impossible. Hutton collected evidence to show that the earth's surface had suffered many long-range upheavals that had led to changes in the sea level, leading to a process of renewed land sculpturing. This demonstrated that the earth is much older than had been generally believed. William Smith contributed to develop a method by which geological strata could be dated, through the study of the fossils embedded in them. Through the analysis of the fossils he was able to demonstrate that quite different types of plants and animals had inhabited the earth's surface at different periods of its geological history Thus was presented a general picture of the evolution of organisms from the simple to the complex and from the aquatic to the terrestrial environment. Clearly enough, these scientific discoveries revealed new facts that were at variance with, and contradictory

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to, the accounts contained in the book of Genesis so that there was considerable resistance to them from the religious establishment. Notwithstanding any oppositions of this kind, the mounting scientific evidence in support of the new findings made it abundantly clear that through the course of the many millions of years of the earth's history, life upon its surface has been continuously involved in an endless process of evolution leading progressively to the rise of new and improved species in place of the old ones, which with the passage of time became extinct.

THE DARWINIAN THEORY OF EVOLUTION

Charles Darwin was greatly excited about the idea of biological evolution. He was attracted by the mounting evidence in support of the central idea about progressive and cumulative changes in life, from the simple to the most complex. He engaged himself in amassing all available information on this subject, which appeared to him to offer irrefutable proof that life upon the earth had evolved through a long-drawn process of gradual change spread over millions of years. This encouraged and inspired him to delve deeper into the hitherto unresolved processes through which evolution of life had taken place. Through many years of tireless work, Darwin succeeded in finding the answer. The detailed account of his findings was published in his monumental book *The Origin of Species by Means of Natural Selection*, first published in 1859. Although many finer points of Darwin's original thesis have since been revised as a result of later advances in knowledge in the field of genetics, the basic theory remains intact. The fundamental ideas in Darwinian theory of evolution included:

1. *The struggle for existence.* In nature there is continuous struggle for existence among the various species of plants and animals. Scientific evidence showed that over considerable periods of time, the number of individuals in any species (in any community of plants or animals) remains almost constant. From this he inferred that the number of offspring of any species that survive to reach maturity and to breed, is balanced by the number of mature individuals that die each year.

2. *Variation within species.* We find that in any given generation there is considerable variation among individuals in any society. The same is true about other organisms in nature. Except for some cases in twin births, we hardly ever come across two individuals completely resembling each other in detail. Darwin wrote that when a large number of individuals belonging to a single species are examined, we find considerable variation among them in regard to structure, complexion, activity pattern, and the like and that these differences appear to have been passed on from one generation to the next so that, for example, children of tall parents tend to be tall.

3. *Survival of the fittest.* Since individuals in any given society vary in

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individual characteristics, it is inevitable that some are stronger than others. Given the fact of perpetual struggle for survival in nature, it is obvious that only the strongest—the fittest—shall survive and proliferate. This helps to maintain the characteristics that had enabled the species to get the better of others who had lacked this quality. This process of struggle and selection in nature goes on endlessly, so that with the passage of time, the members of the species progressively become better adapted to withstand the vagaries of its environment.

4. *Natural selection.* The environment itself undergoes a slow process of long-term changes. The changed environment of the species demanded from it a new set of characteristics to withstand its hardships, so that the process of selection and survival had to start afresh each time, and only those individuals of the species survived to breed and perpetuate that were most capable of meeting the demands of environmental change.

From the foregoing discussion it is clear that "Darwin's theory was not simply one of evolution, but concerned a mechanism whereby random variations in plants and animals could be selectively preserved, and by inheritance lead to changes at the species level" (Stoddart, 1966). As Stoddart underlined it, in geography, however, Darwinism was interpreted in the sense of a "continuous process of change in a temporal perspective long enough to produce a series of changes" (Scoon, 1950, p. 5). It was in this restricted sense that the term evolution was used by many a worker in the natural as well as the social sciences. These students ignored the fundamental point that Darwin's main interest in propounding his theory of evolution was in the mechanism through which evolution progressed rather than in "evolution" (in the sense of change through time) itself. In the social sciences in general, and geography in particular, the central element in Darwinian theory, i.e., the role of randomness and chance, had passed almost unnoticed.

Following the pattern set by Stoddart (to whom we owe much of the discussion that follows) the rest of this discussion is focused on the following four main themes in Darwin's theory, which appear especially relevant to discussion on the impact of evolutionary biological theory on geographical thought:

1. The idea of change through time;
2. The idea of organization;
3. The idea of struggle and selection; and
4. The role of randomness and chance variations of character in nature.

Time and Evolution

Early in the 19th century (1830–1833), Scottish geologist Charles Lyell (1797–1875) published a three-volume work on *Principles of Geology*, which challenged the widely held mediaeval notion regarding the age of the earth. On the basis of scientific evidence collected, Lyell put forward the theory

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that the present-day landforms on the earth's surface are produced by a slow process of evolution spread over a long process of geological change. This theory of landform evolution cut at the root of the mediaeval notion of catastrophic origin of the earth as a divine creation. His predecessor James Hutton (1726–1797) had already demonstrated the theory of *uniformitarianism* in landform evolution, according to which the processes of landform change seen to be operative at the present time are sufficient to account for all the landform changes that occurred in the past, and that the cumulative effect of this ceaseless process of change is visible in the structure and form of the present-day landforms. The works of Hutton and Lyell had greatly impressed Charles Darwin, so that his first major scientific publication on *The Structure and Distribution of Coral Reefs* in 1842 was inspired by the idea of evolution through change over time. The work demonstrated how atolls were formed by slow transformation of fringing reefs into barrier reefs and then into atolls through the process of slow subsidence—spread over a long period of time. The initial deduction and subsequent development of the theory of atoll evolution closely resembled his later approach to the origin of species.

Darwin's work on the origin of atolls, and the idea regarding slow transformation of biological species over time, together inspired American geographer W.M. Davis to develop his own theory of the cycle of erosion and landform transformation as a slow process of change in time. However, Davis' major difficulty lay in the fact that, unlike Darwin who dealt with species, Davis took his illustrations not from the species or the population, but from the individuals, i.e., isolated landforms. As such, Davis' cycle of erosion was essentially nothing more than denudation chronology.

As Huxley (1887) had underlined long ago, "the *Origin of Species* [was] the logical sequence of [Lyell's] the *Principles of Geology*". The concept of *uniformitarianism* in geology, and later on in biology, involved the need for time far in excess of what was until then allowed by theology.

> Once the reality of small but cumulative variations was established in biology, a similar conclusion followed. Time became one of Darwin's chief requirements... When Davis in 1899, therefore, wrote his paper on cycle of erosion... it was time which he singled out as of most practical value (Stoddart, 1966).

Thus the Davisian concept of cycle of erosion was inspired by the central idea in the Origin of Species regarding changes in species through time and Davisian geomorphology adapted the biological analogy of aging to the development of landforms: It was deductive, time-oriented, and imbued with mechanistic notions of causation. It derived its uniformitarianism from Lyell, and its theme of change through time from a simplified view of the theory of biological evolution.

Very similar views were propounded in plant geography, especially ecology, under the leadership of Clements (1916). In the social sciences, however, the development of the time perspective had to await the emergence of a historical tradition following the concept of prehistory in the 1830s.

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The first major contributions in this regard included Sir Henry Maine's *Ancient Law* (1861), E.B. Taylor's *Early History of Mankind* (1865), and his *Origin of Civilization* (1870). These together set a fashion in the developmental interpretation of history, until Malinowski offered a functional interpretation in the 1920s.

The concept of change through time also became a dominant theme in human geography, more specifically in the Berkeley School under the leadership of Carl O. Sauer. Sauer and his students focused on in-depth study of historical evolution of settlements in the American southwest and elsewhere. It was also the central theme in Whittlesey's idea regarding sequent occupance. To conclude:

> Primarily ... geographers interpreted the biological evolution in terms of change through time: what for Darwin was a process became for Davis and others a history... For a time "evolution" implied little more than the idea of change, development, and "progress" and Darwin was in spite of himself seen as its author (Stoddart, *op. cit.*).

Organization and Ecology

The theme of organization and ecology was implicit in Darwin's theory of evolution. In Chapter 3 of the *Origin of Species* he wrote that he was greatly impressed by the "exquisite" adaptation and interrelationships of organic forms "to each other and to the physical conditions of life". This was a major inspiration in Haeckel's (1869) *New Science of Ecology*. Thus, irrespective of theological resistance and opposition to any concept that attempted to contradict the concept of divine creation, in the immediate post-Darwinian period, man had himself become a subject matter for scientific investigation. Part of the reason was that in his later publications such as, *Expression of Emotions of Man and Animals* (1868), and *Descent of Man* (1871) Darwin had himself treated man at the same level as other living organisms.

Haeckel's views on ecology were highly influential in setting a trend in the study of man in relation to his environment. From about 1910 onwards, the term "human ecology" was frequently used to refer to studies of this kind. Writing in the year 1946 American sociologist Richard Park had observed that human ecology deals with the web of life, the balance of nature, the concepts of competition, dominance and succession, biological economics and symbiosis. The source of inspiration lay in the contemporary cross currents in biology. American geographer Harlan H. Barrows (1923) had echoed similar sentiments in his Presidential address to the Association of American Geographers, wherein he said that the aim of geography was:

> to make clear the relationships existing between natural environments and the distribution and activities of man... to view this problem... from the standpoint of man's adjustment to the environment, rather than that of environmental influence.... The centre of geography is the study of human ecology in specific areas.

Barrows' views had led to a good deal of opposition, since it appeared to

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banish the study of geomorphology from the field of geography. As such, his ideas failed to receive any significant support among fellow geographers, except for the Berkeley school which was concerned with studies of the origins of settlements from a developmental-ecological perspective.

The concept of organization, and organism, in geography predates Darwin but the earlier concept of organism was purely teleological in origin, and it involved explanation by analogy. After Darwin, organic analogy lost its earlier metaphysical connotations, so that it became more biological in orientation and expression. It had now got replaced by a more explicitly ecological approach. Ecological studies became more specifically empirical in method, and they slowly replaced the previously popular geographical tradition of synthesis through analogy that was so dominant in the time of Humboldt and Ritter, and half a century later, in the French school of regional studies under Vidal de la Blache. No doubt, organismic analogy had had its uses: It served as a unifying theme in our increasingly particularistic discipline, so that referring to his scheme of Natural Regions, Herbertson (1913-1914) stated that his Natural Regions represented "definite associations of inorganic and living matter with definite structures and functions with a real form and possessing regular and orderly changes as those of a plant or an animal". Herbertson maintained that like plants and animals, regions could also be ranked into species, genera, orders and classes. Such organismic thinking also pervaded the scheme of regions proposed by another British geographer, Unstead (1926). Likewise, Ratzel's scheme of political geography had been deeply inspired by the Darwinian theory.

As Fleure (1929, p. 13) wrote: the fundamental criterion for application of organismic analogy was that the phenomenon under consideration should possess properties of organization of its constituent parts into a functionally related mutually interdependent complex, which possesses properties which are more than the sum of its parts. Methodologically, however, the organismic analogy in geography was theoretically an unsound approach to explanation, since it was a synthetic notion that gave no assistance in the actual course of investigation. Besides, it was an idiographic concept in an increasingly nomothetic science (Siddal, 1959), and so was abandoned as a working principle in geography by the end of the 1930s.

Selection and Struggle

Among geographers who used the concept of struggle and selection in the course of environmental adaptation by human communities, the names of Fleure, Huntington and Griffith Taylor stand out most prominently. Fleure (1919, 1937, 1952) stressed the need for physiological study to assess environmental effects on man. To facilitate such studies he devised a typology of human regions—regions of difficulty, of effort, of increment. However, the theme, as it has developed since the time of Fleure, is far too technical in approach, and therefore, beyond the competence of the average student of geography. Elsworth Huntington, on the other hand, had focused on the theme of natural selection, environmental influences and human populations

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on a worldwide scale, so that it required little expert knowledge of the biological sciences. Griffith Taylor used this in his studies on races, states, and towns, but the questions that Huntington and Taylor asked could not be meaningfully answered in terms of the generalized approach adopted, so that the whole determinist-possibilist controversy had moved on to a philosophical rather than an empirical level. This theme was, however, most effectively developed in Ratzel's political geography. (For details *see* Dikshit, 1997, chapter 1.)

Randomness and Chance

As discussed in the foregoing paragraphs, the Darwinian theory in geography was generally interpreted either in terms of change through time (Davis) or as struggle and selection (Ratzel). In either case, the Darwinian theory was applied in an overwhelmingly deterministic perspective. This was contrary to Darwin's own intentions since in his theory of biological evolution, the element of chance played a major part, so that irrespective of the running theme of environmental adaptation the Darwinian approach to evolution was, at its core probabilistic rather than deterministic. Only much later, in the 1960s, did geographers begin to recognize the importance of stochastic processes, i.e., processes involving randomness and chance, in geographic change.

The geographers' neglect of the role of randomness and chance is somewhat surprising in view of the fact that "the study of this blind chance in theory and practice [was] one of the greatest scientific performances of the nineteenth century" (Merz, 1928). Part of the reason for the neglect lay in Darwin himself, in the sense that his theory "made a clear distinction between the way in which evolution was effected, and the course of evolution itself: Geography seized on the latter and ignored the former. Darwin began with the idea of the selection of 'chance' variations, which are 'no doubt' governed by laws. These laws Darwin failed to discover, and in time came to emphasize chance less and less" (Stoddart, 1966). Thus, "Darwinism in the sense of development or evolution through time was seized on in geography as a unifying principle to subsume vast quantities of otherwise discrete and apparently unrelated data.... But called Darwinism or not, it omitted Darwin's central theme" (Stoddart, 1966).

Conclusion

The foregoing discussion showed that of the four major themes in Darwinian theory of evolution, geographers picked only the following three: the notion of change through time (Davis), of struggle and selection leading to survival of the fittest (Ratzel), and of interrelatedness of phenomena existing together in specific locations on the earth's surface (the concepts of organization, organic analogy, and ecology). Thus, the central point in Darwin's theory regarding the role of randomness and chance in the process of evolution, was completely neglected, so that Darwin's essentially probabilistic theory

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was interpreted in geography in a conspicuously deterministic manner. The influence of Darwin in the chorological geography of Hettner-and-Hartshorne was also clearly visible in its central focus on the concept of spatial organization, which emphasized the interdependence of phenomena of diverse origins existing together in particular segments of the earth's surface.

Darwin's lasting contribution to the philosophy and methodology of modern science lay in that:

1. He separated scientific inquiry from *a priori* assumptions of the teleological kind;

2. In the face of irrefutable evidence presented by Darwin in favour of gradual evolution of phenomena in nature, theology itself began to turn away from meddling in scientific matters, and soon started to acknowledge that the Bible was no authority in the field of science (Livingstone, 1992, pp. 149–155);

3. Darwin also succeeded in giving the final seal of approval to the general acceptance of the concepts of uniformitarianism and law-like statements in science, and thereby completed the dismissal of the notions of Providential interference and catastrophism in science;

4. Darwin's unique contribution to modern thought lay in that he was the first to establish man's place in nature, and thereby succeeded in making man himself a valid subject for scientific inquiry.

ECOLOGY AND ECOSYSTEM AS A GEOGRAPHICAL PRINCIPLE AND METHOD

The preceding discussion underlined the intellectual roots of Haeckel's science of ecology in Darwinian theory of evolution, particularly his concept regarding close relationships obtaining between organisms and their natural habitats. Sadly, however, mainstream geography as a chorological science focused on the study of areal differentiation, had completely failed to gauge the methodological potential of the concept of ecology as a working principle in geographical work. The Hettner-Hartshorne paradigm had projected geography as a branch of knowledge with a unique integrating function focused on the synthesis of knowledge derived from other specialized disciplines about phenomena of diverse kinds existing together in particular segments of earth-space. (In this the function of geography was seen as almost parallel to that of history, which synthesizes information in a time context.) Such an exceptionalist position for geography implied that as a branch of knowledge, geography stood isolated from mainstream scientific thought. The wind of change came only in early 1950s initially through the works of Schaefer and Ackerman—a line of thought that received more focused attention from William Bunge (1962, 1966). By the end of the 1960s, geography bade goodbye to exceptionalism, so that it became generally accepted that in its aims and method, geography is no different from other

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fields of scientific inquiry. Each of them is engaged in the pursuit of extending the frontiers of knowledge through the search for general principles and theories.

Neither of the two concepts of geography, namely areal differentiation, and search for organic analogy in man-environment relationships could provide the discipline an analytical tool of sufficient power to lead to new insights. Only in the 1960s did the geographic profession become alive to the methodological potentialities of the ecosystem concept. Many a scholar began to underline that geography and ecology had much in common: Both are concerned with distribution, organization, and morphology of phenomena on the surface of the earth, so that the two disciplines inevitably converge in terms of concepts and techniques. Also, both are concerned with the study of organisms in the context of the natural environment in particular places and locales.

The term ecosystem was formally proposed by Tansley, the noted plant ecologist, in 1935. He further elaborated this concept in 1946, in his book *Introduction to Plant Ecology*. As originally presented, ecosystem was a general term to signify both the biome—the whole complex of organisms naturally living together as a sociological unit—and its habitat. All the elements—organic as well as inorganic in any ecosystem represent a closely interacting system. In any mature ecosystem the diverse elements constituting the system are in approximate equilibrium. Tansley's concept has since been further refined and elaborated by other students of ecology. Fosberg (1963, p. 2) has defined the concept as follows:

> An ecosystem is a functioning interacting system composed of one or more living organisms and their effective environment, both physical and biological.... Description of an ecosystem may include spatial relations, inventories of its physical features, its habitats and ecological niches, its organisms and its basic reserves of matter and energy; its patterns of circulation of matter and energy; the nature of its income (or input) of matter and energy; and behaviour or trend of its entropy level.

Viewed thus, the earth's surface itself represents a huge ecosystem, first named by Cole (1958) as the ecosphere (derived from *eco*system and *bio*sphere).

Properties that Recommend Ecosystem Concept to Geographical Work

1. The ecosystem concept is *monistic*, so that it brings together man and the plant and animal worlds within a single framework, within which their mutual interaction can be analysed. Whereas, being aesthetic in nature, the Hettnerian as well as the Vidalian concepts of terrestrial unity could not provide a useful tool of analysis; the ecosystem concept being functional in design, offers a sound working principle for geographical analysis of man-environment interaction in specific areas and regions. Besides, since the ecosystem concept combines both the physical and the biological environment in a single interacting system, it helps to resolve the age-old

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problem of dualism in geography—that between physical geography (focused on study of the physical environment) and human geography (concerned with the study of human organization and its spatial consequences).

2. Ecosystems are structured in an orderly, rational, and comprehensible way, so that once the framework of any spatial system is clearly defined, it is possible to systematically analyse it.

3. Ecosystems are functioning systems involving continuous throughput of matter and energy. Thus, after the framework is clearly set out, it is easy to quantify the nature of the interaction patterns between its components.

4. Ecosystem is a kind of general system—an open system tending towards a steady state under the laws of open system thermodynamics. Following the development of the laws of open system thermodynamics, many of the older concepts of ecology are being reinterpreted.

5. Ecosystems may be conceptualized at different levels of complexity from a single farm unit to the national system of agriculture in any country. The ecosystems possess structural properties of theoretical models, so that as in the case of theoretical models, a first approximation of system structure may be reached by selection, simplification, and ordering of data at a series of levels. Accordingly, with the adoption of the concept of ecosystem, geographical systems may be examined at a series of levels or scales, beginning with the framework level (such as settlement hierarchies or a transportation network), to simple information systems focused on the analysis of the mechanisms of supply and demand, to the still more complex levels of social organization.

The Concept's Problems and Potentialities

As Stoddart wrote, tradition-bound geographers may object that the study of ecosystems in geography is not new, and that it is not geography. It is true that the concept of system was implicit in most geographic work, but as contrasted to older geographical work implicitly subsuming the notion of system (or organization), the ecosystem analysis calls for explicit illustration of the structure and functions of the community or the system under investigation with a view to establishing precise (quantified) links between its components. This certainly is very different from the earlier work in geography that remained focused on generalized description of the phenomena under investigation. This was what had generally passed on as geographical synthesis.

As regards the charge that the ecosystem model is nongeographical, in that it does not define the earth's surface as its special object of study, it may be instructive to cite Davies (1961), who wrote: "Ecology is the study of environmental relationships; geography is the study of space relationships", but "what is not clear is where one stops and the other starts". To sum up,

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> Within any areal framework the ecosystem concept will give point to inquiry, and thus highlight both form and function within a spatial setting. Simplistic ideas of causation and development, or of geographic dualism are irrelevant; ecosystem analysis gives the geographer a tool with which to work (Stoddart, 1965).

As Stoddart further wrote, by virtue of its general systems properties, the ecosystem concept brings geography back into the realm of natural sciences, and allows geographers to participate in the scientific revolutions of the twentieth century from which the exceptionalist stance of the chorological model geography (adhering to rigid application of the Kantian notion of division between fields of knowledge) had until the 1960s excluded us. With the introduction of the concept of general system "geography could no longer stand apart in its isolated 'integrating' position". (For fuller discussion on this theme, refer to Stoddart, chapter 10 in Dikshit, 1994.)

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11

Geography and Environmentalism

MAN-NATURE RELATIONSHIP

The relationship between mankind and the physical environment is a theme that has held the attention of man from the beginning of civilization. During the premodern phase, the general assumption the world over was that nature sets the stage for human development, though the approach to nature-man relationship varied from one society to another, depending upon whether nature of the habitat was friendly and, therefore, benevolent or the natural conditions were hard from the viewpoint of the mechanics of living. The former case is exemplified by wet tropical and subtropical environments of old cultural lands of South and East Asia—the traditional realms of Chinese and Indian cultural influence. In these civilizations, Nature was viewed as the gift from the benevolent Almighty God, so that it needed to be preserved: It was necessary to develop a state of peaceful coexistence with nature so that in the process of their use by mankind, the resources of the natural environment were not disturbed beyond the natural capacity of the environment to replenish itself. The indigenous philosophies and religions were geared to the maintenance of the ecological balance in nature: Man was part of nature (like the rest of sentient nature—the plant and animal kingdom). The case of the Hebrew and Greek cultures which grew through a process of hard struggle against an unfriendly and harsh environment was altogether different. Nature had to be vanquished, to be conquered and won over, in order to clear the path for cultural development. Progress depended on changing the character of land through human ingenuity, by irrigation and the use of fertilizers, for instance, in order to make it yield the required resources for progress. Thus, under the European cultural realm, "the environment came to be seen as a metaphor for triumph over struggle, for dominant forms of social management over the weak, and for the production of capital and resource surplus as an essential prerequisite to the class domination that was necessary to allow society to progress" (O'Riordan, 1989, p. 78). This was the view of Nature-as-usufruct, a view that (in the words of O'Riordan) was used as an excuse for persistent exploitation of the weak, whether the weak was the natural world or the lesser mortals e.g., in the overseas colonies in the tropical lands (Asia, Africa, and Latin America).

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Nature-as-usufruct is still the dominant view in all industrial societies the world over, who hold on to essentially an "I-thou" perspective—an essentially conflictual view of the man-environment relationship. It is rare to come across such a conflictual perspective in man-nature relationship in the case of marginal cultures occupying marginal environments and possessing rudimentary technologies. They had not, unlike in India and China, worked out any elaborate philosophy (it could not be possible given the stage of development) but their propensity for disturbing the natural environmental balance through excessive use of natural resources was checked by intricate social institutions that rewarded communal sharing and punished self-indulgent expenditure.

The Deterministic Perspective

Geographers' interest in the study of man-environment relationships got a new lease of life after the publication of Darwin's *The Origin of Species* (1959), owing to the underlying emphasis on ecological relationship between an organism and its environment in the evolutionary thesis, and the notions of organization, and struggle and selection. The Darwinian theory gave new respectability to geography as a field of learning. The fact that the Darwinian theory of biological evolution through selection and struggle in which the fittest survived appeared to offer a scientific justification for European domination of the lesser mortals in Asia, Africa and Latin America. Geography as the science of environmental relationships became the vehicle for putting forth this justification for European imperialism in the second half of the nineteenth century. Indeed, many modern geographers (e.g., Hudson, 1977; Stoddart, 1986) have argued that the rise of geography as a university-level discipline in the last quarter of the nineteenth century owed a great deal to its usefulness in the task of justifying the current phase of European imperialism in terms of the varying natural qualities and abilities of the different "racial" groups. The justification was carried out through disciplinary focus on environmental determinism. The line of argument pursued was: Differences in physical and mental abilities of different societies, and in the level of their cultural and economic potential and achievement, were caused by the regional differences in the quality of natural environment, so that European domination of people in other lands was natural and in line with the wishes of the Creator. The inherent competitiveness and aggression in capitalism and imperial expansionism were justified as the natural pattern of behaviour for any species in terms of the Darwinian thesis. Indeed, English philosopher Herbert Spencer advocated the application of the Darwinian theory to the study of human society—a line of thought that came to be known as social Darwinism of which the best advocate in geography was German geographer Friedrich Ratzel. This was the most popular theory of geography pursued the world over during that period of European domination.

As noted in the discussion on the rise of political economy perspective in human geography, such a deterministic perspective on man-environment

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relationships was opposed by the anarchist Russian geographer Kropotkin (1924). He agreed that man's interaction with nature generated certain human qualities, but he was opposed to the social Darwinist view of what these qualities were. As against the social Darwinist view that man-nature interaction naturally led to qualities of competitiveness and aggression, Kropotkin argued in favour of the qualities of cooperativeness and sociability, though his was almost a lone voice in the wilderness; environmental determinism in geography reigned supreme.

According to Glacken (1956, 1967) three different modes of nature-society or man-environment relations have permeated the history of Western thought:

- Humanity in harmonious relationship with nature;
- Humanity as determined by nature; and
- Humanity as modifier of nature.

The man as modifier and conqueror of nature view has dominated modern thought though the other two perspectives have by no means been completely absent. The first forceful attack on the tenets of environmental determinism in modern geography came only in the late 1920s from Wittfogel (1929) who denied the thesis of direct natural causation of inherent human characteristics. He maintained instead that human labour organized in different social forms moulded nature into the different material bases for economic development of regional societies. This is what created the distinctive regional cultural traits, rather than the environment *per se*. Thus, man made himself: Societies are human creations rather than natural/environmental creations. Wittfogel was, however, not opposed to the idea of natural forces being a potent influence in man's life upon earth. In particular, he drew attention to the climatically determined need for irrigation which in the East (India and China) gave rise to a line of social development that was greatly at variance with the one followed in the rainfed agriculture pursued in the West, giving rise to entirely different kinds of civilizations in the two cultural realms (Wittfogel, 1957). But, conventional geography tended to stand firm in its support of the current social order, and this was one of the reasons for its widespread adoption in schools and universities.

The Possibilist Perspective

An alternative view of environmentalism in geography around the beginning of the twentieth century found wide acceptance in France according to which the physical environment offers opportunities for a range of possible directions of development, and it depended on human initiative as to which particular direction of progress was chosen. This basic premise that the environment presents a range of opportunities, and it is for human groups in particular places to choose between them, came to be known by the name of possibilism. This view is generally identified with the French school of human geography that developed around the turn of the twentieth century

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under the leadership of Vidal de la Blache. The possibilistic view of man-environment relations developed by Blache represented a middle course between the views of the French sociologist Emile Durkheim (who proposed that human geography should be reduced to the study of *social morphology*, comprising, "the mass of individuals who comprise the society, the manner in which they are disposed upon the earth, and the nature and configuration of objects of all sorts which affect collective relations") and the German geographer Friedrich Ratzel.

Vidal rejected Durkheim's view of human geography as social morphology, and insisted instead that man "joins in nature's game" and the external environment (*milieu externe*) was a partner not a slave of human activity. On the contrary, he shared Ratzel's view that society ought not to be left "suspended in the air", that it must be placed against the environment in which it grows; but he squarely rejected any notion of environmental determinism associated with the Ratzelian view of geography as propounded by his American disciple Ellen Churchil Semple (1911). He was emphatic that "nature is never more than an advisor", and that man's interaction with the external environment revealed the human being as "at once both active and passive". The Vidalian approach to the environment followed a middle course between extreme (radical) possibilism and strict environmental determinism. Blache rejected the view that society and nature stood out as adversaries in the man-environment confrontation. For him, man was part of nature ("living creation") and, therefore, its most active collaborator. The concept of *genre de vie* (way of life) was Vidal de la Blache's formulation to resolve the man-environment duality, in that the life styles of the people in particular locales revealed that physical geographical factors and human ingenuity collaborated to create distinctive *genre de vie*.

French historian Lucien Febvre supported Vidal's view in his famous phrase "there are not necessities but everywhere possibilities; and man as master of these possibilities is the judge of their use" (Febvre, 1932). This was a modified view of the Vidalian perspective, since in its essentials the Vidalian view of possibilism "could still legitimately be regarded as a qualification rather than a negation of environmental determinism" (Gregory, 1994). As Gregory points out, the possibilist concept became so distorted by the 1950s that it seemed to pose a threat to the scientific status of geography as an autonomous discipline. In the first place, critics argued that scientific laws are essentially deterministic, so that in order to become a branch of scientific learning, human geography required laws "similar in stringency to those of physical science" (Martin, 1951). This was countered by the view that the traditional emphasis in geography on *contingency* (something liable to happen as an adjunct to something else) and *probabilities* was consistent with the concept of modern physics (Jones, 1956; Lukermann, 1965). Secondly, the distinctiveness of geography was defined in terms of the relationship between society and nature in which the physical "foundation must in large part control the superstructure" (Spate, 1957). Spate suggested the concept of "probabilism" as compromise between

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extreme positions of environmental determinism on the one hand, and radical possibilism on the other. Probabilism held the view that although the physical environment does not exactly determine human actions, it does exert considerable influence on human action so that certain responses are more likely than the others. Human action was a combined response to natural environment interacting with technological advance of the society under reference. The environment offered a range of probable choices but only one of these could become actuality (or possibility). Which particular probability shall become actuality depended on the stage of technological advance.

The concept of probabilism was closely parallel to the neo-environmentalist view of *stop-and-go determinism* developed by Griffith Taylor (1951). Taylor maintained that it may be that the well-endowed parts of the world offer a number of different possibilities for making a living; but in some nine-tenths of the earth's land area, nature speaks out clearly— "this land is too dry, or too cold, or too wet, or too rugged". He wrote that the settlers who fail to heed this nature-given limitation must face disaster. According to Taylor, the role of nature was far from crudely deterministic, but the environment was nevertheless a potent force in human action which man could ameliorate but not escape. It is like the case of the flow of traffic on a busy road. The traffic policeman cannot wish away the traffic that must necessarily flow. All that he does is to regulate the traffic through the temporary stop-and-go method. The human agency, through the use of technology, can modify the force of nature but it cannot escape it. The role of human agency is similar to that of the traffic regulator.

NATURE-AS-NURTURE: THE CURRENT VIEW OF MAN-ENVIRONMENT RELATIONS

Although an old perspective on man-environment relationship in the East, the nature-as-nurture view in the West caught the attention of academics and social activists only in the 1960s as an antidote to the long prevailing view of nature as usufruct; though (as O'Riordan, 1989, p. 79, recalled) "In essence, ever since it broke clear of pure subsistence economics, ... human society has always recognized its capacity to destroy the environs as greater than its ability to restore the damage within a manageable period of adjustment". The central objective of the current view on environment is "to place humankind in its ecological setting, simply as one of the sentient species". It aims at human well-being, and is focused on the belief that this is possible only if nature is accorded its rightful place as a friendly partner in the process of development and growth. It is built upon a deep faith that survival of mankind is dependent on the survival of a healthy and ecologically balanced earth environment. The debate on environmentalism revolves around two fundamental issues: First, resource exploitation is inevitable for human survival; and that in this process, it is inevitable that man shall take more than he returns. This leads to entropy—the steady

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increase in energy dissipation (and chaos)—that makes it progressively more difficult to maintain the organs of social stability, so that eventually society may begin to spend more effort in maintaining order than it generates by way of new energy and wealth. It is also obvious that the very process of competitive exploitation is a class-dominated process: The rich and resourceful always have the upper hand. The second issue revolves around the hope that there is hope for a better future based on the faith that ultimately the moral fibre in human nature shall prevail leading to greater concern for the survival of the species as against narrow personal gains.

As O'Riordan wrote, "Environmentalism is a collage of values and views of the world, a general patterning of predispositions, being first and foremost a social movement, though with political overtones", so that "green politics" is currently in ascendence in Europe. It is based on the philosophy that "embraces Earth-centredness, a sense of altruistic communalism, non-violence, and a concept of time that is almost timeless" (O'Riordan, 1989, p. 80). In the 1970s, green politics in the West had moved from the state of voluntary environmental pressure group to the mainstream party politics, in that there are now open debates on environmental implications of governmental policies in diverse areas. The promoters of green politics view themselves as the "people of the old world trying to create a new one" (Petra Kelly's foreword to J. Porritt's *Seeing Green*, 1984). According to Porritt, greenness is the politics of ecology and life interests, against the current politics of exploitation and class interests. It is the politics of Earth-respectfulness and people-caring. But with the adoption of greenness as a manifesto in mainstream European politics, the advocacy of greenness in politics has assumed a "predatory purpose" showing disposition to exploitation with a view to political gain.

The Current Meaning of Environmentalism

Modern writing on this subject distinguishes between two alternative perspectives on environmentalism: The conservative view of society-nature relationship wherein nature provides a metaphor for morality and a guide to rules of conduct; and the radical or manipulative perspective in which the spirit of competition in skill dictates the terms of ethics and conduct. God as the personification of the unknown, the unknowable, and the mysterious is a common metaphor in both. This is considered important because man is supposed to possess a sense of responsibility to nature (Creation) in seeking guidance regarding how to act on the Earth. It becomes the vital restraining mechanism in avoiding the destructive power of societal exploitation of resources.

The essential difference in perspective between the conservative or maturing and the manipulative view of environmentalism lies in the conceived position regarding the relationship between God, Nature, and Man. Under the conservative mode of thought the order of precedence was: God-Nature-Man, that is, God first made the Earth (nature) and then man. This was the original Hebrew view of Genesis later adapted by the

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nineteenth century European Romanticists. According to this view, therefore, human morality was shaped by the right of nature—environmental conservation and maintenance of ecological balance in nature. Man was, under such a perspective, supposed to live with nature, preserve the environment, avoid wastefulness and recognize the essential unity of sentient existence. In the manipulative perspective on the environment on the other hand, the order of precedence is: God-Man-Nature, so that it is believed that the Earth (nature) was created for human exploitation; man was primary and nature secondary, so that man created his own standards of morality. The conservative mode of thought and practice is essentially *ecocentric,* as contrasted to the manipulative perspective which may be described as *technocentric.* "Environmentalism seeks to embrace both worldviews: indeed it is the constant interaction between these positions that gives environmentalism its special dynamic qualities" (O'Riordan, *op. cit.*, p. 85).

The technocentric perspective on the environment is essentially a usufruct perspective: it is *interventionist* in ethos and approach, based on faith in the application of scientific skill, market operation and managerial ingenuity. A milder version of this approach is *accommodative* in man's relations to nature, and is based on faith in the adaptability of societal institutions and approaches to assessment and evaluation with a view to accommodating environmental demands. The ecocentric perspective is based on the belief that

> the Earth has her own law, a natural law in the original sense of these words, deeper than human enactments and beyond repeal.... Who treats her well receives blessings; who treats her ill suffers privation, for she gives with even-handed measure. Earth forgives but only to a certain point, only until the balance tips and then it is too late (Hughes, 1983, p. 56, cited in O'Riordan, *op. cit*).

In the current literature on environmentalism, such a faith is identified as *Gaianism*—a term derived from the Greek goddess Gaia, the nurturing mother figure from whom all sustenance on the Earth was derived. Gaia's daughter Themis was the Goddess of Justice. Under the Greek concept, justice was equated with retribution (i.e., reward for those who treated the environment well and punishment for those who treated it ill through over-exploitation and thereby disturbed the ecological balance). The scientific view of Gaianism is presented by the geochemist James Lovelock (1979). According to this view life upon the Earth is manipulated by living organisms which through their naturally coordinated interaction help smooth out disturbances in the atmosphere, lithosphere and hydrosphere so that a complicated life-sustaining state is maintained on the earth surface. The operative aspect of Gaianism is faith in *communalism,* that is, faith in the cooperative capabilities of societies to establish self-reliant communities based on renewable resource use and appropriate technologies.

A closely akin environmental concept is the concept of deep ecology developed by several Scandinavian, Australian and American thinkers (Fox, 1984; Devall and Sessons, 1985; Tobias, 1985). The philosophy of deep ecology

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provides a justification for sacredness of life upon the earth, and promotes equality of, and respect for, all sentient beings in terms of their essential interdependence for survival and their origins from the same cosmic force. For adherents of deep ecology, self-realization for human beings consists in recognizing the inherent solidarity with the totality of life forms constituting nature. Green movements in various countries in the West, as also the Animals Rights campaigns are the manifestations of this kind of thought.

Indian philosophy has, from the beginning, recognized the basic unity of man and nature. For Indian thinkers man has always been a part of nature, and there has been a basic faith in the cosmic brotherhood between man and other species in the plant and animal kingdoms, so that one of our ancient *rishis* was Shukdev (parrot god), one of our mythological gods was Varah (boar), not to mention the most popular God form, Hanuman (the monkey—*vanar-avatar*). The deep ecology ethos has been an inherent part of the Indian way of life and thought. Compassion for non-human forms of life, including non-violence and special attention to the cow, have been its manifestation in the day-to-day life of country folk, and the Hindu tradition had enjoined special blessings for those who preserved the environment through planting trees and building water-storage tanks for public use. The various environment protection movements in India, beginning with the *Chipko* Movement in the U.P. Himalayas, are recent manifestations of this old tradition made necessary by destabilization of the fragile environment in the relatively marginal lands. Mahatma Gandhi was—in terms of the living practitioner of the dying tradition—a true Gaian or Deep Ecologist. The Chipko and other movements owe a great deal to the Mahatma's principles. The main environmental movements of various kinds in India include: Chipko and related movements for forest life and environmental protection in Uttarakhand (the U.P. Himalayas), the "Save Narmada" movement in Madhya Pradesh and the protest movements associated with the construction of Narmada Sagar Dam, and the Sardar Sarovar Dam in Gujarat, and the Silent Valley Movement in Kerala, the protection of environment against bauxite mining which threatens tribal life in the Gandhamardan Hills in Orissa, and the *Appiko* Movement for the protection of the environment in the Western Ghats. (Brief descriptions of these and some others are given in Karan, 1994.)

The Concept of Sustainable Development

The concept of sustainable development, made popular through the 1987 report of the World Commission on Environment and Development, presents an intermediary position between the somewhat contrasting perspectives of the developers and the ecology-minded environmentalists. According to the World Commission's report, sustainable development stands for "development that meets the needs of the present without compromising the ability of the future generations to meet their own needs" (p. 43). It is based on the concept of wealth creation attuned to nature's capacity to renew and replenish resources; it is rooted in the utilitarian concept of

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resource-management, and it insists on a synthetic view of the complex interrelationship between the physical and the social, and combines an ecological basis to economics and local self-reliance. However, such a perspective, in order to succeed, calls for a comprehensive shift in the distribution of power in society and, as such, wholesale changes in institutional structure which is a tall order. These considerations do not, however, stop the sustainability and development advocates. The idea has, however, come under attack from those who perceive ultimate limits to growth, and view further development (in terms of economic growth) and sustainability as mutually exclusive propositions. The idea has also been criticized as "a convenient formula used to maintain the notion of growth and development as a way of avoiding or finessing intractable questions of distribution" (Emel, 1994).

As O'Riordan wrote, a distinction must be made between sustainability and sustainable utilization. *Sustainable utilization* is the term used by the International Union for the Conservation of Nature (1980) to denote a rate of resource uptake which equals the rate of renewal and replenishment. Although it is possible to increase yield by technological manipulation, the basic principles of replenishable extraction have to be honoured. *Sustainability*, on the other hand, incorporates ethical norms in the Gaia tradition, including emphasis on taking due consideration of the rights of the future generations of all living species. Sustainability, therefore, is "a reformist notion in the [neo-Marxist] radical tradition of opening up institutions of economic investment and resource development to a far greater sense of Gaian accountability" (O'Riordan, 1989, p. 94).

Geography and Environmental Education

Right from the days of George Perkin Marsh geographers have been involved in environmental protection and the creation of a concerned attitude towards the environment. The book, *Man's Role in Changing the Face of the Earth* presented by the followers of Sauer in his honour, was part of this continuing interest. As Mikesell (1974, p. 2) wrote: "developments in geography have been such that the several phases of national preoccupation with environmental problems have not produced a general awareness of interests and skills". As part of such a realization on the part of the geographical profession in the United States, the Commission on College Geography of the Association of American Geographers (AAG) had set up a Panel on Environmental Education, and established a Task Force on Environmental Quality which reported (Lowenthal, et al., 1973) that geographers were best qualified to function as leaders in environmental education in view of: (a) The breadth of their training which imparts them the ability to handle and synthesize material from a wide range of sources, (b) The geographers' view of causation as a multi-lateral and complex phenomenon, (c) The geographers' training in tapping or deriving information from diverse sources, (d) Geography's focus on the spatial distribution of phenomena

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on the earth surface, and (e) The established tradition of environmental study in the discipline.

More recently, Stoddart (1987) underlined that the reason for the geographers' failure to contribute to the current debate on environmentalism in a meaningful way has arisen from the fact that they have failed to recognize what, according to Stoddart, should be "the central intent and indeed self-evident role in the community of knowledge", that is: the study of "Earth's diversity, its resources, man's survival on the planet". Such a role for geography calls for a unified discipline—both physical and human—in which our task as a profession should be: "To identify geographical problems, issues of man and environment within regions—problems not of geomorphology, history or economics or sociology, but geographical problems: and to use our skills to work to alleviate them, perhaps to solve them" (Stoddart, 1987). For Stoddart, the geographers' focus on research in topics like the geographical influences on the cinema, or the distribution of fast food outlets, and such other esoteric topics of little relevance to societal problems of the day are wasteful diversions—unnecessary fiddling with trifles. His message to fellow geographers is loud and clear: "Fiddle if you must, but at least be aware that Rome is burning all the while". The current position in the discipline is that:

> While bridges have been built across the human-physical geography interface, there has been no integration of the study of the physical and social processes; for human geographers their links with other social scientists are much stronger than environmental scientists (Johnston, 1991, p. 209).

Through its input in environmental education—creating informed attitudes about the environment, and the ways and means of preserving the balance of nature—geography has the opportunity for contributing in the all-important task of preparing the students as responsible citizens. It is an area of study through which geography can be projected as the integrated discipline focused on the study of the earth as the world of man; but this would require considerable effort at updating our physical geography syllabi with much greater input of science. (For a comprehensive statement on geography and teaching of the environment, reference may be made to Dikshit, 1985,,reproduced in Dikshit, 1994.)

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12

Place, Space and Locality: The Current Focus in Human Geography

LOCALE, LOCATION AND SENSE OF PLACE

The concepts of place, space and locality are closely related. Place denotes a portion of geographical space occupied by the phenomenon under reference (a person, thing or event). The concept of space is more complex, and it subsumes the concept of place. Blaut called space as "a treacherous philosophical word", and distinguished between the concepts of "absolute space" and "relative space". Absolute space was described as "a distinct, physical and eminently real or empirical entity in itself" so that absolute space is a concrete manifestation of space—it is a place or spatial structure where phenomena are rooted. A relative view of space conceptualizes space as "merely a relation between events or an aspect of events, and thus [it is] bound to time and process" (Blaut, 1961).

Agnew has underlined three important aspects of place: locale, location, and sense of place:

> *Locale* refers to the structured "microsociological" content of place, the settings of everyday, routine social interaction provided in a place. *Location* refers to the representation in local social interaction of ideas and practices derived from the relationship between places. In other words, location represents the impact of the "macro order" in a place (uneven economic development, the uneven effects of government policy, segregation of social groups, etc.). *Sense of place* refers to the subjective orientation that can be engendered by living in a place. This is the geosociological definition of self or identity produced by a place (Agnew, 1987, pp. 5-6).

Thus, place is not just a locale—the setting for activity and social interaction—but also a location. It is also the *place* where the reproduction and transformation of social relations take place. Thus as Pred (1984, p. 279) wrote:

> Place... always involves an appropriation and transformation of space and nature that is inseparable from the reproduction and transformation of society in time and space. As such, place is not only what is fleetingly observed on the landscape, a locale, or setting for activity and social interaction (Giddens, 1979, pp. 206-207; Giddens, 1981, pp. 39 and 45).

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It is also what takes place ceaselessly, that contributes to history in a specific context through the creation and utilization of a physical setting.

Everyday practices in particular places give rise to a sense of place or a structure of feelings—a "felt sense of the quality of life at a particular place and time" (Pred, 1983, p. 58). Place, therefore, represents both a spatial object (a segment of earth space) as well as a process of social and historical transformation. Modern social theory now increasingly gives recognition to the reality that time-space interactions are involved in all social existence. Human practice is a time-space process, so that places over time become the products of the social and political institutions which, in their own turn, were shaped (at least in part) by place perspectives. Viewed thus, rather than being epiphenomenal (that is, of secondary importance) to society, place is central to social structuration.

Focus on place—the traditional focus in the French tradition of regional geography pioneered by Blache—and the notion of sense of place was promoted by humanistic geographers in the 1970s. During the 1980s, interest in this concept grew outside humanistic geography, so that economic geographers like Doreen Massey (1984) sought to highlight the role of place specificity in social and economic processes across space. Agnew (1987, 1989) has argued the case of place perspective as the central focus in political geographical analysis. As Entrikin (1991) wrote, a place perspective subsuming the totality of place and its contextuality, implies occupying "a position that is between the objective pole of scientific theorizing and the subjective pole of empathetic understanding".

Sack (1993) has underlined three ways in which place and space exert basic effects on the deepest levels of human existence: "in or out of place" "spatial interaction", and "surface and depth".

> In or out of place refers to territorial control as constructive of social relations or power. Spatial interaction refers to the role of space in natural science causality and its application to human behaviour. Surface and depth, or appearance and reality, refer to the role of space and place in problematizing meaning. Each of the three is implicated in the others. So not only is geography constructive of natural causes, social power, and meaning, but also space and place draw together the respective realms of the natural, the social and the intellectual, which is the concrete meaning of the term mutually constitutive. Integrating these diverse realms is another and combining effect of space and place—one that helps explain the capacious qualities of geography.

Referring to the complexity of the concept of space, Harvey (1973, pp. 13-14) noted that the problem of conceptualizing space "is resolved through human practice with respect to it", and he added:

> In other words, there are no philosophical answers to philosophical questions that arise over the nature of space—the answers lie in human practice. The question "what is space?" is therefore replaced by the question "How is it that different human practices create and make use of distinctive conceptualization of space?"

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This represents the *relational* view of space, according to which "space is contained in objects in the sense that an object can be said to exist only insofar as it contains and represents within itself relationships to other objects" (Gregory, 1994). Thus distinction is sought to be drawn between *objective space* and *social space*. Contemporary geographers maintain that social construction of space and social implication of space (spatiality) should be grounded not in objective space (or objects in space) but man-made space (place or locale) within which social practice takes place. Analysis of social space today is increasingly focused on relations of class, ethnicity and gender "which are inscribed in (and in part constituted through), its places, regions, and landscapes. In this sense, spatial analysis has indeed become social analysis and vice versa" (Gregory, 1994a).

FOCUS ON LOCALITIES: THE RISE OF NEW REGIONAL GEOGRAPHY

The term "locality" is fashionable in current human geography, but there is no consensus regarding its technical meaning in the profession. In general terms, the term connotes a scale of study at lower than the national level—it refers to a subnational level focus in study—and in that sense conveys a meaning somewhat similar to the meaning of place or small region. The locality debate in contemporary human geography is traced back to the critiques of historical materialism and a modified perspective on the constitution of society in the 1980s associated in particular, to the ideas of Anthony Giddens (1981, 1984). Geographers extended the debate to the explanation of spatial structures and the process of restructuring of economies, so that Massey (1984) argued that an understanding of areal variations in social, economic and political change was important in any scheme of restructuring regional economies in Britain.

Giddens (1984) underlined that locales (or localities) refer to the use of space to provide the *settings* of interaction, such settings are essential to the understanding of the contextuality of any interaction. He was emphatic that it is an error to define locales in physical geographical and material artefact terms alone: "A 'house' is grasped as such only if the observer recognizes that it is a 'dwelling' with a range of other properties specified by the modes of its utilization in human activity" (Giddens, 1984, p. 118). Locales or localities, therefore, provide the functional contexts for life's activities—social, economic and political. Giddens developed the concept of *structuration* as a theoretical perspective to account for the ways in which people learn about and transform social structures. Structuration is thus a place- and time-specific process; and as a theoretical construct, *structuration* is a *contextual* approach to social reality—an approach that underlines the falseness of attempts at distinction between social relations and spatial structures, since spatial structure, far from being a simple arena where social relations unfold, is the medium through which such relations are produced and reproduced. Thus human *spatiality*, or socio-spatial dialectic,

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involves the combined process of social production of space and the spatial construction of society.

Such a view of the structuration of social, economic and political life lies behind the current focus on locality studies in the West. By saying this, it is not implied that Giddens was necessarily the source of inspiration to start with, since similar ideas were being put forward by some other scholars around that time (e.g., Urry, 1981, *also* Urry, 1987). But the trend set by Giddens' work in social science practice was certainly a seminal influence; his *locale* became locality in geographical studies notwithstanding the recognition of differences between the two conceptual constructs: Massey (1991) viewed localities as "the intersections of sets of locales" though the basic idea that locales are socially constructed places applies to localities as well. At the time of significant transformations in social and economic geography of Britain in the 1980s, geographers were being increasingly drawn to the need for the study of localities in terms of spatial variations in the structuration processes obtaining therein in the face of the wave of socioeconomic transformation set in motion.

The government of the United Kingdom, through its Economic and Social Research Council (ESRC), translated this concern for the study of the impact of the current restructuring on particular places and regions by sponsoring a series of research programmes, which included: the "Changing Urban and Regional System" (CURS) programme, the "Social Change and Economic Life" programme (SCEL), and the "Economic Restructuring, Social Change and the Locality" (ERSCL) programme. A key concern in all these programmes of study was "to collect detailed empirical evidence to assist the identification of the nature, causes and consequences of spatial differentiation in processes of change" (Painter, 1994). The pursuit of this research raised a series of methodological issues including:

1. Delimitation of localities for research. Though many types of statistically defined areas—such as labour market areas—were used for study, the consensus opinion was that localities (in order to be socially realistic) must be "defined in terms of the sets of social relations or processes in question" (Massey, 1991).

2. The relationship between locality research and critical realism. Realism is a philosophy of science which is based on the use of abstraction to identify the necessary *causal power and liabilities* of particular *structures* which are realized under specific (contingent) conditions. Thus realism in practice involves (a) Identification of *causal mechanisms,* which relates to seeking answers to the question: "How does something happen?"—typical of intensive research; (b) Identification of *empirical regularities* involving the answer to the question: "How widespread is the phenomenon under investigation?"—a concern typical of extensive research.

The realist researcher makes a clear distinction between the two sets of objectives in research, since the realist researcher believes that "what causes something to happen has nothing to do with the *number of times*

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it happens", as Sayer (1985) puts it. It is a distinction that the empiricist and the positivist researchers fail to recognize so that realism is described as anti-positivist. Realism in the context of locality studies implies that: (a) Localities are contingent outcomes of the combined operation of a number of causal processes: social, economic, cultural and political; (b) Localities in their turn become causally powerful social objects that influence other processes such as state policies and locational decisions; (c) Locality studies are intensive research efforts which seek to unravel these processes and identify relations which define social structures.

Locality study in geography in the current mode was pioneered in Britain by Doreen Massey in her *Spatial Division of Labour* (1984) which contained a number of case studies on this theme. She also played a major role in the development of the Changing Urban and Regional System (CURS) programme of the Economic and Social Research Council of Britain carried through a series of seven case studies in different localities. The result was reported in a volume introduced and edited by Cooke (1989). The introduction to the volume stated that "The overall objectives of the programme were to explore the impact of economic restructuring at national and local levels, and to assess the role of central and local government policies in establishing or constraining localities, through their various social and political organizations, to deal with processes of restructuring". Cooke underlined that through these studies it was also aimed "to establish the conceptual status of the idea of 'locality'". Locality was described as "the space within which the larger part of most citizens' daily working and consuming lives is lived" and within which their citizenship rights are contested and defined. In his summary of the inferences derived from the seven case studies Cooke (1989, p. 296) stated:

> Localities are not simply places or even communities: They are the sum of social energy and agency resulting from the clustering of diverse individuals, groups and social interests in space. They are not passive or residual, but in varying ways and degrees, centres of collective consciousness. They are bases for intervention in the internal workings of not only individual and collective daily lives but also events on a broader canvas affecting local interests.

In his comments on the CURS initiative in an article in the *Antipode,* Neil Smith (1987) expressed doubt that the detailed focus on localities runs the risk of *empiricism* (i.e., accordance of special priviledge to empirical observations over theoretical statements) since they tend to stress on unique characteristics of localities—an emphasis that subordinates theory and generalization. As Painter (1994) wrote:

> Smith's apparent equation of theory with generalization might itself be read as an empiricist position, and would not necessarily be accepted either by the locality researchers or within the tradition of Marxist geography from which Smith was writing.

But the difficulty involved in combining the search for theory with detailed

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focus on localities cannot be completely discounted: "Anyone trying to mesh theory with empirical observation soon learns that the movement among abstract concepts and empirical description [in regional geography] is like performing ballet on a bed of quicksand" (Pudup, 1988). But it is a challenge well worth taking.

The focus on locality studies in the social structuration perspective has given rise to some kind of a reconstituted regional geography which (according to Lee, 1985) increasingly gives recognition to the fact that:

1. Social processes operate in specific historical and geographical contexts so that their proper understanding calls for sensitivity to spatial variations in the operation of those processes.

2. Society is not a fixed phenomenon: It is being continuously recreated by human actions; and since these actions take place in specific historical and geographical contexts, the societal recreation is by implication historically and geographically variable.

3. Such regional and local transformations do not occur in isolation; they are (at least in part) the outcomes of wider social relationships.

4. Thus regions are not fixed divisions of territory. Rather, they represent changing social constructions.

Since regions are territorial entities that are being constantly produced, reproduced and transformed through social processes, and since they provide the settings for social interaction—the theatre where people learn their culture and contribute to its perpetuation— "a major goal of geography should be to uncover the nature of those regions" (Johnston, 1991, p. 247).

The local-global dialectic in the study of localities and regions challenges the view that modernity, i.e., emphasis on novelty, change and progress through technology,

> erases difference and replaces it with homogeneity—so many traditional regional geographies were of lost worlds of pristine difference (cf. Entrikin, 1989)—but the complex ways of differentiation and integration that are being recovered in these new accounts raise questions about: (i) other modes of description, of what Jameson (1991) called models of "cognitive mapping" capable of figuring...the late twentieth century world of *hyperspace* and the culture of *post-modernism* or...of ways of representing the new forms of dependence, hybridity and interconnection installed by *time-space compression* and *time-space distanciation* (Appadurai, 1991); and (ii) the ethnocentrism of contemporary theory and whether...it is adequate to the task of representing other voices and other cultures (Gregory, 1994b).

THE LOCALITY RESEARCH AND THE SOCIAL SCIENCE THEORY

Addressing the question: "What is locality?", Simon Duncan (1989) pointed out that the main reason for the rise of interest in locality research in the 1980s lay in the current social science theory, that is, in questions how the world should be explained rather than in real world changes themselves.

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The re-emergence of interest in the spatial dimension in the analysis of social behaviour and structure is traced in the growing distaste for functionalist explanation of social behaviour—a form of explanation that attempted to explain social phenomena by reference to the functions they performed for the social system under the capitalist mode. Castells (1977, 1978), for example, viewed cities and towns as the site for the consumption processes involved in the reproduction of labour power. This perspective was enforced by a form of structuralist Marxism. The functionalist explanation was criticized for its failure to explain how the people acted in particular cities and towns. The functionalist explanation only depicted spatial variations in the pattern of behaviour from city to city but failed to explain the reasons for the observed differences in behaviour. These shortcomings of the functionalist mode of explanation were taken up in detail by Anthony Giddens (1979, 1981, 1984) in his works on social theory. Functionalism, it was pointed out, failed to accord due importance to the role played by human agency. The functionalist concept of society with its own coherence and structure has now been replaced by greater emphasis on the "specificities of different social structures and entities", so that, in the words of Duncan, there is a move "away from theoreticism (where empirical research on specific situations was disparaged) and a reaction against structural determinism (in which human agency was dispelled from social explanation)" (Duncan, 1989, p. 224):

> This theoretical change was reinforced by the social and political context of the late 1970s and early 1980s. Understanding how capitalist society worked at a general level seemed to have little connection with how people acted; ignoring the abstract expose they voted in large numbers for the right-wing governments both in Europe and North America. It would be necessary to work on the level of people's immediate—usually local—concerns both in terms of political action and the research informing it. Hence,.... questions of specificity and spatially uneven development were very much back on the agenda.... Given these linked theoretical and contextual changes, the emergent focus on locality as the substantive basis of a new research programme becomes easier to understand (Duncan, 1989, p. 224).

However, Duncan warns of "the danger of the pendulum swinging too far in the other direction"—that is, the danger that the emphasis on locality study may become "a means for allowing spatial determinism to creep in unnoticed" or to allow the theoretically untenable notion of "autonomy of the spatial to re-emerge in a new form". In reality, localities are hardly ever autonomous subnational social entities—they must continually interact with other such units within and without their region. Indeed,

> Spatial patterns are not autonomous from social organization, nor does space determine social organization and activity. Similarly, it is incorrect to talk as though there was interdependence between the different spatial objects themselves. It is social objects which interact, not the spatial patterns they form, and ... this stands as much for localities as for regions or for centre and periphery (Duncan, *op. cit.*, p. 228).

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13

The Geography of Gender

FEMINIST GEOGRAPHY

The term feminist geography subsumes perspectives on feminist politics and the theories that explore gender relations in society, as applied to the study of gender relations in geography. Interest in the study of feminism dates back to the mid-1970s. It drew inspiration from the women's movements in the West in the 1960s as part of the radicalization of societal perspectives. Feminist geography is thus part of the radical-Marxist orientation of human geography following the "relevance revolution" of that decade. As the Women and Geography Study Group of Institute of British Geographers (1984) put it, "In common with other approaches in geography which are critical of mainstream work", feminist geography tries to "analyse and understand why women remain in subordinate position" in society and the professions. To the feminist geographers, implications of gender in the study of geography are at least as important as the implications of any other social or economic factor which transforms society and space. They use the term *gender* to refer to *socially* created distinctions between feminity and masculinity, while the term *sex* is used to refer to biological differences between men and women. Thus the IBG group defined feminist geography as "a geography which explicitly takes into account the socially created gender structure of society; and in which a commitment, both towards the alleviation of gender inequality in the short term and towards its removal, through social change towards real equality, in the long term, is expressed". A feature common to all feminist argument is that the differences in social positions of men and women systematically work to the advantage of men so that women and men in fact have unequal power, opportunities, and social status. Feminist geography aims at exploring the ways in which current practices in society might be changed in order to release women from the state of subordination. Studies aimed at examining differences in spatial behaviour patterns of men and women are decried, since:

> At its worst, this can simply lead to a proliferation of topics in...the discipline in which the spotlight is simply turned on to women: as in, for example, "women and development", "women and transport geography", "women and housing".... At its best, such work may document and

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> demonstrate the social inequalities facing women, but it will not explain *why* these have arisen (Women and Geography Study Group (WGSG), 1984, p. 25).

Distinction is sought to be drawn between radical feminism and socialist feminism. Radical feminism considers the subordination of women by men as the primary inequality in human society. It is argued that the division of labour between men and women had preceded (and given birth to) the division of labour between class and race. The radical feminists insist that elimination of sexual oppression (subordination) should form the cornerstone of attempts to eliminate other types of oppressions in society. The radicals insist that men and women form (at the present) the two fundamental classes in society. Just as Marx urged the working classes to seize control over the means of production so also the radical feminists (like Firestone, 1971) insist that women must seize control over the means of biological reproduction in order that they are freed from male domination. However, in this entire process emphasis has to be given to gender roles rather than sexual roles. The root cause of the oppression of women in society is traced to the system of *patriarchy* which is defined as a set of social norms of relation between men and women which establishes a pattern of interdependence and solidarity between them which functions in favour of male domination over females. From such a perspective, men and women appear to them to form two somewhat antagonistic classes irrespective of divisions on either side on the basis of age, race and income status. The adherents of radical feminism emphasize that male domination of the man-woman relationship has resulted in restricting women largely to the *private sphere* where they are made to carry out many personal services for men—services which remain largely unreciprocated—apart from having to carry the burden of child rearing. Patriarchy, therefore, works to ensure that the vast majority of women remain legally and economically dependent on their men. This process of subordination through patriarchy begins early in life so that little girls are allowed far less freedom of movement than boys of the same age, and the process becomes all the more visible at the adolescent stage. *Radical* feminists appear united in viewing men as the enemy in their struggle for women's liberation; they insist on examining women's and men's behaviour in terms of *interrelationships* between the two genders, setting aside other types of cleavages in society.

The *social* feminists, on the other hand, attempt to link gender relations to the wider framework of social relations existing in society as a whole. The social feminist viewpoint represents the human face of the left movement. Social feminists differ from their radical colleagues in their emphasis on patriarchy as the root cause of all other societal inequalities in relation to women, and they reject the notion that "men are the enemy" and favour unity between men and women in the struggle between classes, though they continue to focus on female subordination and the ways and means of alleviating it. Thus, social feminism represents the welfare stream of radical feminism.

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Attempts to bring about a rapproachement between the two perspectives in feminist studies have focused around the theme of male domination of women which forms the common focus of both the approaches, and man-woman participation in the class struggle. On the latter point, there is a basic difference between the feminist and the Marxist theories. Whereas in the former, the family is accorded the central role in the maintenance of patriarchal relations in society, in the Marxist theory the family is viewed primarily in terms of its role in the reproduction of labour force. In terms of the Marxist theory, the labour of workers is the ultimate source of value (measured in terms of capitalist goods and commodities).

> Thus, for the process of production to continue, workers must be clothed, fed, sheltered and rested while not at work, to enable them to be fit to return to work each day, and some provision must also be made for the longer-term needs of the capitalist as workers eventually grow too old to work, and die. This last need is met at least in part, by the fact that workers have children who grow up to become workers in their turn. Reproduction of labour force therefore, involves all the activities of caring for workers and the upbringing of potential workers (WGSG, 1984, p. 30).

Viewed in this light, the family (particularly the role of women as wives and mothers) is a vital element in the process of reproduction of labour force.

There are two areas in which Marxist approaches in geography are found to be of most help in the study of feminism: First, the materialist view of social organization and, second, the notion that the ways of living are specific to contexts of time and place. *Materialism* is based on the notion that society cannot either be understood or changed without analysing the social and technical modes of organization involved in the process of providing basic human needs, in ensuring biological reproduction of the species, and in providing a generally accepted standard of living in society. "However, capitalist-labour and male-female relationships are not the same even within the same capitalist economy and may differ considerably from one country to another...child care facilities [are] provided on such a generous scale in France, and not in Britain, when both are advanced capitalist states" (WGSG, 1984, p. 33).

FEMINISM AND PHENOMENOLOGICAL AND HUMANISTIC APPROACHES IN GEOGRAPHY

As the IBG monograph on *Geography and Gender* has underlined, the phenomenological and humanistic approaches to geography have attracted considerable interest in feminist geography. Both the approaches are characterized by dissatisfaction with the mainstream geography as spatial analysis which, according to the adherents of these approaches, tended to reduce the study of human behaviour to that of a subject (the researcher) contemplating the object (human spatial behaviour). They are also critical

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of the traditional mode of data collection in social science which imposes the observer's framework of thought upon the "objects" studied—rather than trying to reveal what the objects of the study (the community or group) really think themselves. Feminist study also adopts a similar approach:

> Like feminism, these phenomenological and humanistic approaches emphasize the importance of caring and nurturing in relationships with other people and with the environment, and also the crucial role of day-to-day feelings and experiences.... The kinds of approaches advocated by phenomenologists and humanists—such as in-depth interviewing and consciousness-raising sessions, use of insights afforded by novels and other literary sources, and an emphasis on "soft" or qualitative data—can, and have been, developed by feminist researchers (e.g., Roberts, 1981) (*Geography and Gender*, pp. 35-36).

As the IBG report points out, the methodologies of phenomenological and humanistic studies in geography can be used to examine the way in which carrying out of particular activities, and the associated use of particular places and spaces, come to be regarded as feminine or masculine—such as, the notion that "women's space" is inside the home, while "men's space" is at work. However,

> ... a major drawback with such approaches is that there is a tendency so to glorify ordinary, everyday experience, that there is a failure to move beyond the necessary stage of description, self-revelation and empathy to an explanation and of the reasons for those experiences; this in turn is related to a failure to consider how power relations and inequalities in society are interlinked. In fact, it could be argued that phenomenologists and humanists are basically modest reformers, looking for ways in which the ordinary person may better their lot within the chinks and interstices left between the great power relations in society, adjusting to the prevailing patterns of dominance and subordination (*Geography and Gender*, p. 37).

Focus on phenomenological and humanistic perspectives was the beginning of the place perspective in feminist geographies. Social feminist geographers have been increasingly attentive to the ways in which gender relations differ from place to place, and believe that such differences not only reflect but partially determine local economic change. Such an orientation in study, and belief in factors for social transformation were influential in tying feminist geography to the movement toward locality research. Gender relations are sought to be explained in the context of locality research.

Although there are distinctive strands in women study groups, Geraldine Pratt (1994) has identified the following concerns common to each:

1. Each adopts a critical discourse, critical not only of women's oppression in society, but also of the various ways that this is reproduced in geographical theory.

2. They all focus on sexism within geographical institutions (i.e., teaching of geography, and staffing of academic departments, and the publication process).

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3. Commitment to situating knowledge—commitment to the view that interpretations are context-bound, and they are therefore partial rather than universal. For this reason, the feminist researchers emphasize the use of the qualitative modes of analysis (McDowell, 1988).

4. Feminist geographers trace the interconnections between all aspects of daily life, across the subdisciplinary boundaries of economic, social and cultural geography, in order that inferences drawn are more wholesome and realistic.

Pratt identifies three phases in the development of focus in feminist geographies. Phase one is called the Geography of Women which was the dominant perspective from the mid- to the late-1970s. It was characterized by a topical focus on description of the effects of gender inequality; the dominant theoretical influences in study were from the side of welfare geography and liberal feminism; and the geographical focus in study consisted of analysing the constraints of distance and spatial separation. Phase two is termed as Socialist-Feminist Geography which was the dominant view of the theme of study from the early to the late 1980s. This phase was characterized by topical focus on explanation of gender inequality, and relation between capitalism and patriarchy. Major theoretical influences were derived from Marxism and socialist feminism. The geographical focus in study consisted of spatial separation, place and localities. Phase three is named as Postcolonial Feminist Geography. This phase is traced to the late 1980s and continues to the present. Topical focus in this phase consists of the consideration of gender identities, differences among women, gender and nature, and gender and nationalism. Theoretical perspectives in study are derived from cultural, poststructural, postcolonial, and psychoanalytical theories; writings of coloured women, lesbian women, gay men, and women from developing countries. Geographical focus is on:

> microgeographies of the body, distance, separation, place, imaginative and symbolic spaces, colonialism, environment. Although little has as yet been published, feminist geographers are also expanding their consideration of geography to include environmental concerns—this area is likely to receive much more attention in coming years (Pratt, 1994).

Directions for Future Work

Feminist study in geography is now maturing so that approaches to the study are becoming progressively more and more theoretically oriented. Thus, attempts are being made to reconceptualize key terms and ideas. Side by side with this, greater attention is now being paid to the diversity and variety in women's experience of societal discrimination against them, and the crude dichotomy of polar opposites—e.g., male-female, and public-private—are increasingly challenged (McDowell, 1991). Bowlby, Lewis, McDowell and Foord (1989) identify three areas of emerging focus in research, namely, analyses of cultural representations, work on sexuality, subjectivity, and social relations, and new developments in studies of the interrelationship of race, class, and gender. Their argument is summarized below.

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Images of nature and cultural representation. This is primarily concerned with questions about the social construction of nature as female or feminine as a means of perpetrating female subordination and oppression. Notwithstanding the idea about nature as the provider of resources for human survival, nature as mother, nature is almost invariably personified as female, so that, to quote Smith (1984, pp. 13-14):

> ... the treatment of women in capitalist society parallels the treatment of nature. As external nature, women are objects which mankind attempts to dominate and possess, ravage and romanticize; they are objects of conquest and penetration as well as idolatry and worship. The language is exact. Women are put on pedestals, but only once their social domination is secure; precisely as with nature, romanticization is then a form of control. But women can never be wholly external since in them resides fertility and the means of biological reproduction. In this sense they are made elements of universal nature, mothers and nurturers, possessors of a mysterious female institution and so on.

Such distinctions between male and female and between nature and culture were particularly brought to the fore during industrial capitalism's separation of the "public world of the waged labour and the private world of the home". "A great deal of work remains to be done in exploring and analysing the complex interconnections between changing material trends and diverse cultural representations in the contemporary world" (Bowlby et al, 1989, p. 170). Language and literature provide the raw material for such analysis from a contextual perspective. Kolodny's (1975) work provides an excellent example to follow. (Kolodny analysed this phenomenon through representations in American literature in the context of the westward push to conquer nature on the American frontier.)

Feminist geographers are now increasingly interacting with ecologists both at the level of theory and practice:

> Ecofeminism has begun to stress the associations between the oppression of women and the exploitation of natural resources, based on the somewhat uncritical acceptance of the nature/culture link and women's purported closeness to nature through their nurturing role in reproduction (Caldecott and Leland, 1983):

Sexuality, subjectivity, and social relations. The significance of subjectivity in social relations based on sex identity is receiving increasing attention from researchers in women studies. Subjects such as regulation of sexuality, representation and organization of families and other household structures are all areas in which spatial variations play a significant role and which are becoming part of the refocusing of interest in social geography, as widely defined, on locality-based research.

Race, class, and gender. Currently feminist scholars—feminist geographers included—are engaged in debates about the interconnections between class, race, and sexual identity, particularly so in the case of the United States

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where the Black and White division in the population makes the whole issue more complex. Black women writers in particular have argued that ethnocentrism permeates the politics of the women movement so that many of its demands on issues pertaining to family, sexuality, and wage work are based on the desires and experiences only of white women, and that too only of those belonging to the middle income group.

> The conflicts and contradictions that arise from cross-cutting divisions in society—on class, gender, and racial lines—are now a key area for feminist theory and research.... As yet, this feminist work has paid little attention to the existence of differences between areas or the significance of locality.... In the areas of economic and social geography there seems to be a rising awareness that gender relations can no longer be discounted or, if they are, that explanation will be impoverished as a result (Bowlby, Lewis, McDowell and Foord, 1989, p. 172).

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14

Modern versus Post-Modern Geographies

THE MEANING OF THE TWO TERMS

It is currently fashionable to talk of modernism and post-modernism in social discourse though precise meanings of the two terms are not always clear; so that one commentator described them as "the buzzwords of the 1980s". Important issues are, however, at stake so that the debate on post-modernism cannot be dismissed simply as "the product of disciplinary politicking, in which ascendant academics are once again jostling for new stalls in the intellectual marketplace", or as "little more than the cultural logic of late capitalism, the designer label on the baggage of flexible accumulation". But,

> if these twin objections are superimposed, a different reading becomes possible and post-modernism can be seen to mark an unprecedented crisis of intellectual activity within the contemporary crisis of modernity. The debate then has the liveliest of implications for the project of a critical human geography (and critical theory more generally) because it raises acute questions about the very possibility of critique itself (Gregory, 1989, p. 348).

The two terms are closely interrelated so that it is not possible to understand post-modernism without due reference to the history and nature of modernity. Following the *Dictionary of Human Geography* (1994), *modernity* may be described as "A particular constellation of power, knowledge and social practices which first emerged in Europe in the sixteenth and seventeenth centuries, and the forms and structures of which changed over time and extended themselves over space until, by the middle of the seventeenth century, they constituted the dominant social order on the planet". Toward the end of the eighteenth century "the idea of being modern came to be associated not only with novelty but, more particularly, with looking forward rather than backward: with the so-called 'Enlightenment project' of reason, rationality and progress towards truth, beauty and just life". In the middle of the nineteenth century, Marx and Engels found an essential connection between modernity and the revolutionary dynamics of capitalism under the impact of which "All fixed, fast-frozen relations, with their train of ancient and venerable prejudices, are swept away, all

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new-formed ones become antiquated before they can ossify. All that is solid melts into air", wrote Marx and Engels. The beginnings of the modern world system are traced back to the sixteenth century, beginning in Europe, and organized around market exchange at international scale. But the process was greatly intensified through the nineteenth and the twentieth centuries through global scale of economic operations, so that modernity became identified as the system of market-based political-economic structure and organizations. Thus, by the second half of the twentieth century, a profound crisis of identity and representation had begun to be felt all around—in the arts, humanities, and the social sciences—particularly in the Western metropolises and the colonial capitals, owing to the accelerated pace of time-space compression. By the end of the 1950s, the modern way of viewing phenomena in terms of Cartesian coordinates had begun to be questioned, separation between place and space began to be drawn, and the idea of bounded cultures through which one could journey out and analyse other cultures appeared no longer relevant (Clifford, 1988, p. 2). All this called for new approaches to explanation of social reality—approaches focused on space specificity, that is, approaches beyond the modernist tradition of universalism. This was the beginning of post-modernism in social thought.

There are contrasting perspectives on the plus and minus sides of modernity, as defined above. One set of commentators holds that:

> ... modernity was an unqualified human good which promised to banish ignorance, misery and despotism; to free human beings from myth and superstition, disease and hunger, oppression and arbitrary rule. In the middle years of the twentieth century these assumptions culminated in models of modernization, and development programmes of which sought to remake the so-called traditional world in the image of the West (Gregory, 1994a).

But as the critics have noted, these blessings were a mixed lot. Modernism was closely intertwined with the processes and objectives of colonialism and repressive imperialism, besides ethnocentrism rooted in European cultural values and perspectives:

> To other commentators, therefore, modernity has always had its dark side, many of them argued (in different ways) that European modernity installed new grids of power and surveillance which, in Max Weber's well-known image, confined human agency, consciousness and creativity within an "iron cage" of bureaucracy and regulation (Gregory, *op. cit.*).

Giddens (1990) has drawn attention to four major institutional dimensions of modernity: surveillance, industrialism, capitalism, and military power. He has also proposed an equivalent nexus of political strategies wherein the intertwining of the local and the global scales, and of life-politics and emancipatory politics are underlined. Figure 14.1 illustrates the proposed relationships.

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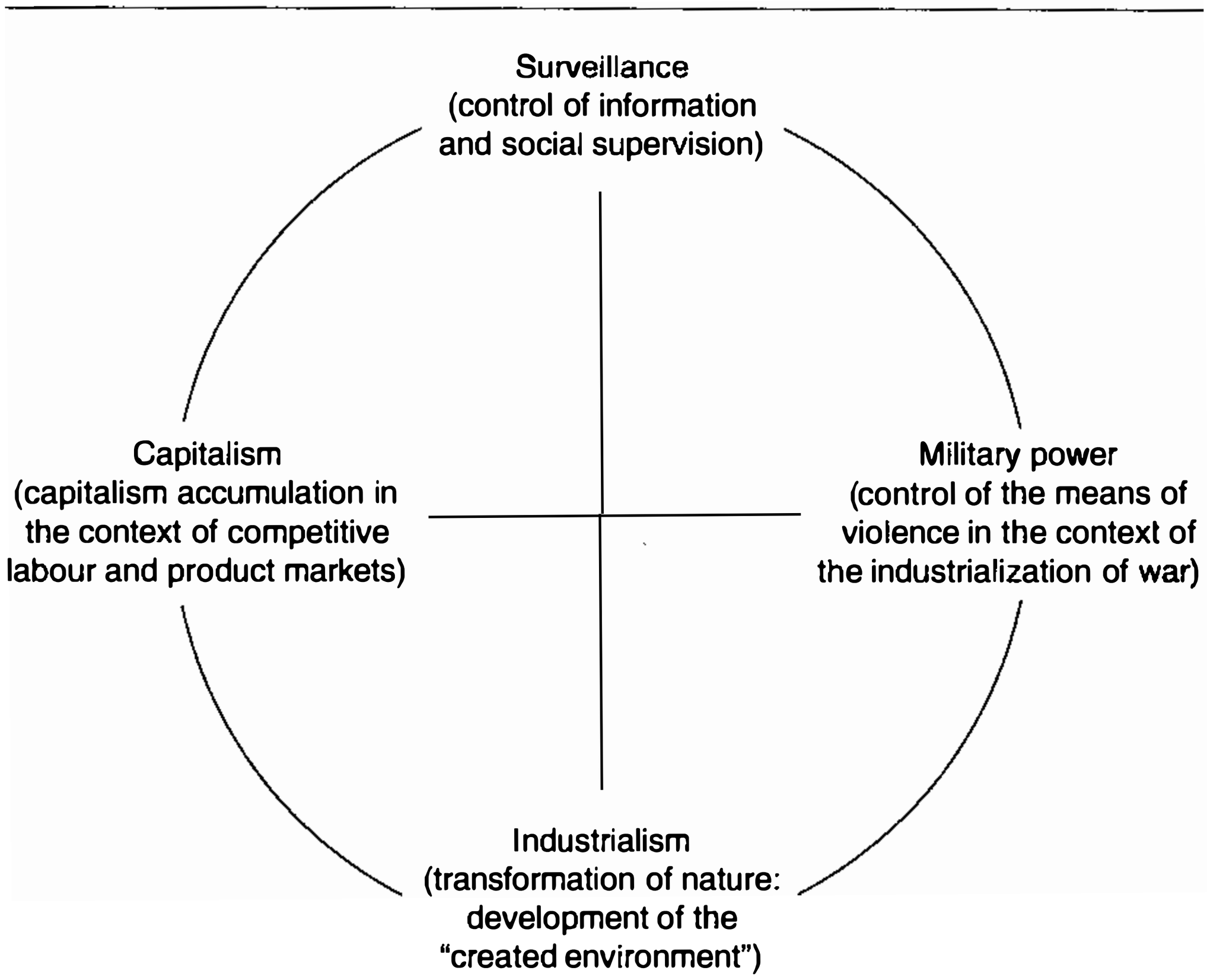
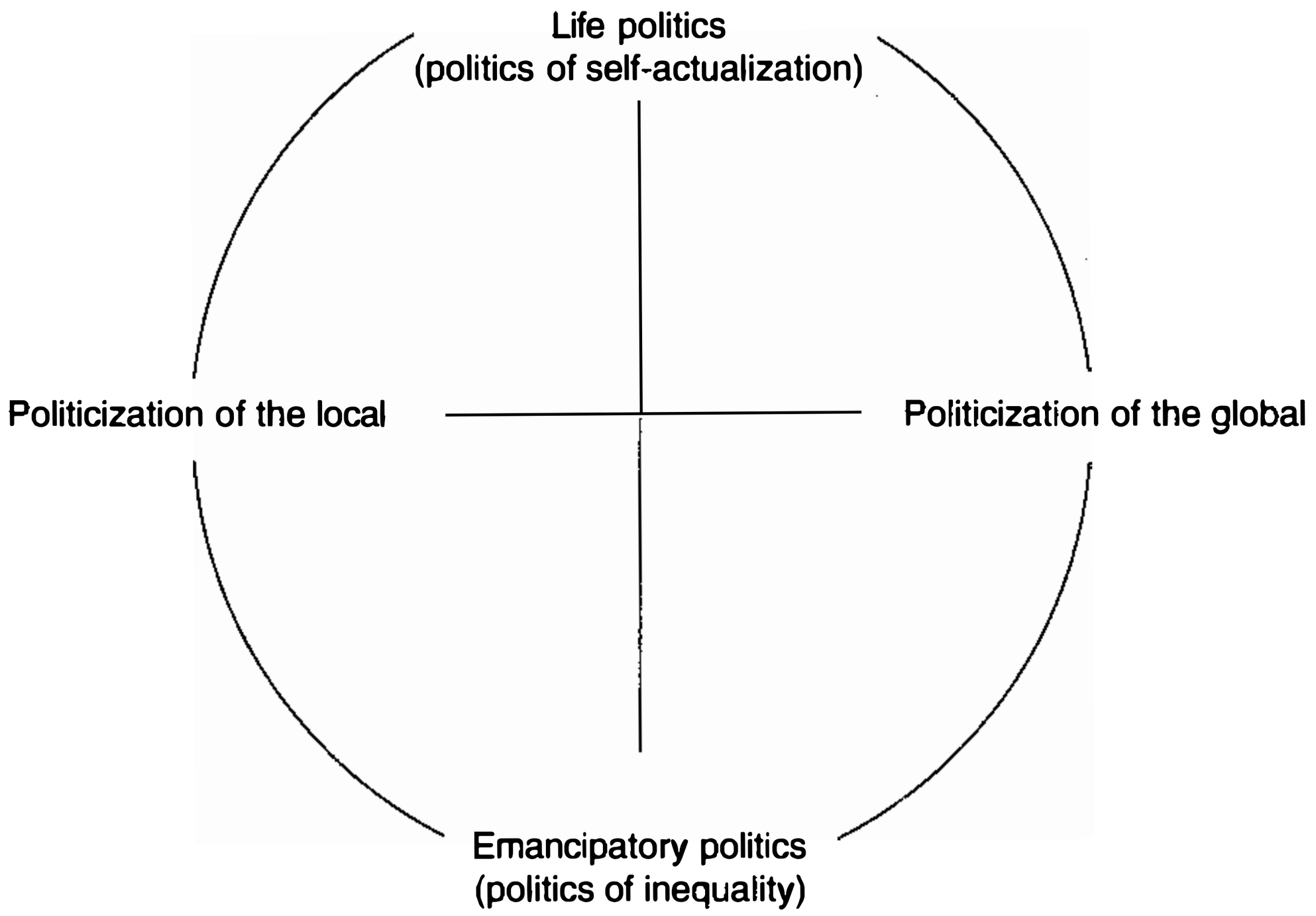


(a) The institutionalized politics of modernity (Giddens, 1990)



(b) The politics of modernity

Fig. 14.1 Politics and modernity (After Giddens, 1990).

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Modernity, Modernization, and Modernism: The Social Science Context

In a social, scientific context Berman (1982) refers to *modernity* as "a mode of vital experience", a collective sharing of a particularized sense of "self and others", and of "life's possibilities and perils". "Modernity is thus comprised of both context and conjecture, the *specificity* of being alive in the world at a particular time and place, a vital sense of what is *contemporary*. As such, it becomes a useful general term to capture the specific and changing meaning of the three most basic and formative dimensions of human existence: space, time, and being; the spatial, temporal, and social orders of human life" (Soja, 1989a, pp. 320-321). The concept of modernity is intimately related to the multiple reconfigurations of social life that have punctuated the historical geography of capitalism since the sixteenth century. In this context, *modernization* refers to "the many different processes of structural change associated with the ability of capitalism to develop and survive, to reproduce successfully its fundamental social relations of production and distinctive divisions of labour". As Soja (*op. cit.*) points out, "these restructuring processes are continuous, but they become especially critical and accelerated during periods of deep and systematic global crisis" like the one we have entered since around late 1960s. Such periodically intensified modernizing episodes of capitalism are, in the words of Berman (1982, p. 16), shaped by:

> ...the industrialization of production, which transforms scientific knowledge into technology, creates new environments and destroys old ones, speeds up the whole tempo of life, generates new forms of corporate power and class struggle; immense demographic upheaval, severing millions of people from their ancestral habitats, hurtling them halfway across the world into new lives; rapid and often cataclysmic urban growth; systems of mass communications, dynamic in their development, enveloping and binding together the most diverse people and societies; increasingly powerful national states, bureaucratically structured and operated, constantly striving to expand their powers; mass movements of people and peoples challenging their political and economic rulers, striving to gain control over their lives; finally, bearing and driving all these people and institutions along, an ever expanding, drastically fluctuating capitalist world market.

In broad terms, *modernism* "refers to the cultural, ideological, reflective and...theory-forming reactions to modernization and restructuring.... Modernism is thus the explicitly evaluative, culture-shaping and situated consciousness of modernity and is itself roughly able to be split into periods in conjunction with the historical rhythms of intensified capitalist crisis, restructuring and modernization" (Soja, 1989a, p. 322, *also see* Soja, 1989b).

The Rise of Modern Human Geography

The discipline of geography as practised over the past two centuries is essentially an "European science" which, according to Stoddart (1986), dates

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back to 1796, the year in which Captain James Cook first entered the Pacific. Cook's was preeminently a scientific voyage carrying on board illustrators, collectors and scientists whose work displayed, according to Stoddart, three features of decisive significance for the transformation of geography into an "objective science" focused on concern for realism in description; systematic classification in collection of data; and the comparative method of explanation. Stoddart maintains that it was the extension of the scientific methods of observation, classification and comparison to the domain of peoples and societies that made geography, as practised for the past two hundred years, possible. (It may be recalled here that it was George Forster—a member of the scientific team that had accompanied Captain Cook—to whom Humboldt owed his interest in the study of geography.)

Following Foucault (1979, 1980), Gregory (1989) has underlined that this was far from a simple "extension" of scientific principles because these scientific principles had the most radical consequences for the constitution of the human sciences and their conception of the human subject. Besides the logic of this extension to peoples and societies "was powered by more than the ship of reason since these nominally scientific advances were at the same time the spearheads of colonialism and conquest: of subjection", so that "its trajectory cannot be separated from what Wolf (1982) once called 'the people without history'. It follows that some of the most seminal cross-fertilizations during this period were those between anthropology and geography, loosely defined, and what later became anthropogeography has to be acknowledged as a tradition of basic importance to the modern discipline". This thread of relationship is indelibly present in the writings of Humboldt, Ritter, and of course, Ratzel and Sauer.

Towards the end of the nineteenth century, a second thread of relationship between sociology and geography had emerged: "the interactions between the two disciplines", Gregory comments, "were, in part, a way of clarifying their different destinations". While sociology, according to Durkheim, was to subsume the study of the spatial structure of society—*morphology sociale*—the Vidalian school insisted on the independent course of human geography predicated, on the one hand, on horizontal (spatial) relations and, on the other, on vertical relations between society and nature (Berdoulay, 1978). Around the same time, Richard Park at Chicago was airing similar views regarding sociology subsuming the study of *morphology sociale*, and he described geography as a *concrete science* wherein interest in spatial relations was restricted to the study of the individual and the irregular (unique), that is, to the idiographic, and not concerned with the elucidation of the general processes and universal principles, as in the case of history. Against the "concrete science" nature of geography, sociology and human ecology were described as *abstract sciences* which, even though their foundations were laid on history and geography, were essentially theory-seeking in their orientation. Thus the encounter between the two disciplines had ended in geography and sociology ultimately developing in isolation from each other (Further details on pp. 177-178).

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By mid-twentieth century, geography had developed close links with economics alongside the existing frontiers with anthropology and sociology. Until the late 1940s, like the rest of human geography, the human geography-economics frontier was pursued in a resolutely empirical manner; but the emergence of the "new" geography in the 1950s and the 1960s gave it a pronouncedly theoretical orientation so that human geography now assumed the characteristics of the abstract sciences, in the sense that like sociology and economics, it also became a nomothetic science but (in general) it continued to eschew the study of the social element. Thus, few of the contributions in Chorley and Haggett's *Models in Geography* (1967) were addressed to social and cultural questions in any manner, and "the geometric order which they supposed to be immanent in the human landscape was derived, for the most part, from the economy: from transcodings of an abstract calculus of profit and loss into an equally abstract 'friction of distance'" (Gregory, 1989), so that human geography was transformed into spatial science.

This short resume of the historiography of geography, according to Gregory, underlines three distinctive features of modern geography. These are:

1. All the three strands were bound into a naturalism-—quite naturally so for a discipline that combines the study of both the human and the physical, but the other branches of the social sciences did not escape the impact of evolutionary biological thought either. "It is scarcely surprising, in consequence, that identical links should have been forged in human geography; from Vidal de la Blache's seemingly simple organicism to Hagerstrand's vision of time-geography as a 'situational ecology'; from essentially Newtonian models of spatial interaction to technically more sophisticated models of dissipative structures within abstract landscapes".

2. All the three strands were woven into a conception of science as *totalization*. Modern science holds that explanation resides in the disclosure of a systematic order whose logic imposes coherence on the apparent chaos observed by the investigator. In the study of man, this scientific tenet involved identifying a *centre* around which social life revolves. The concepts of "social system" or social structure, on the one hand, and the alternative perspective around human subjectivity on the other, served this purpose. As Gregory wrote, both these can be read in human geography, but the formalization of geography as spatial science in the 1960s accorded central place to geometry, i.e., to the search for abstract order in mathematical spaces: "Spatial science was part of an economy of explanation which put a high premium on the *simplicity* of its explanation", so that whatever be the subject of investigation, the same explanatory mould was applied.

3. If the three strands in geography since the beginning of the nineteenth century to mid-twentieth century are joined together, then human geography as spatial science would appear as a natural growth, rather than as representing any break from the past (as it was projected at the time). Geography as spatial science was "a continuation and *culmination* of

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modern geography", in the sense that it helped complete the search for scientific identity of the discipline as a nomothetic science. (Figure 14.2 depicts the sequential construction of human geography as a *modern* discipline.

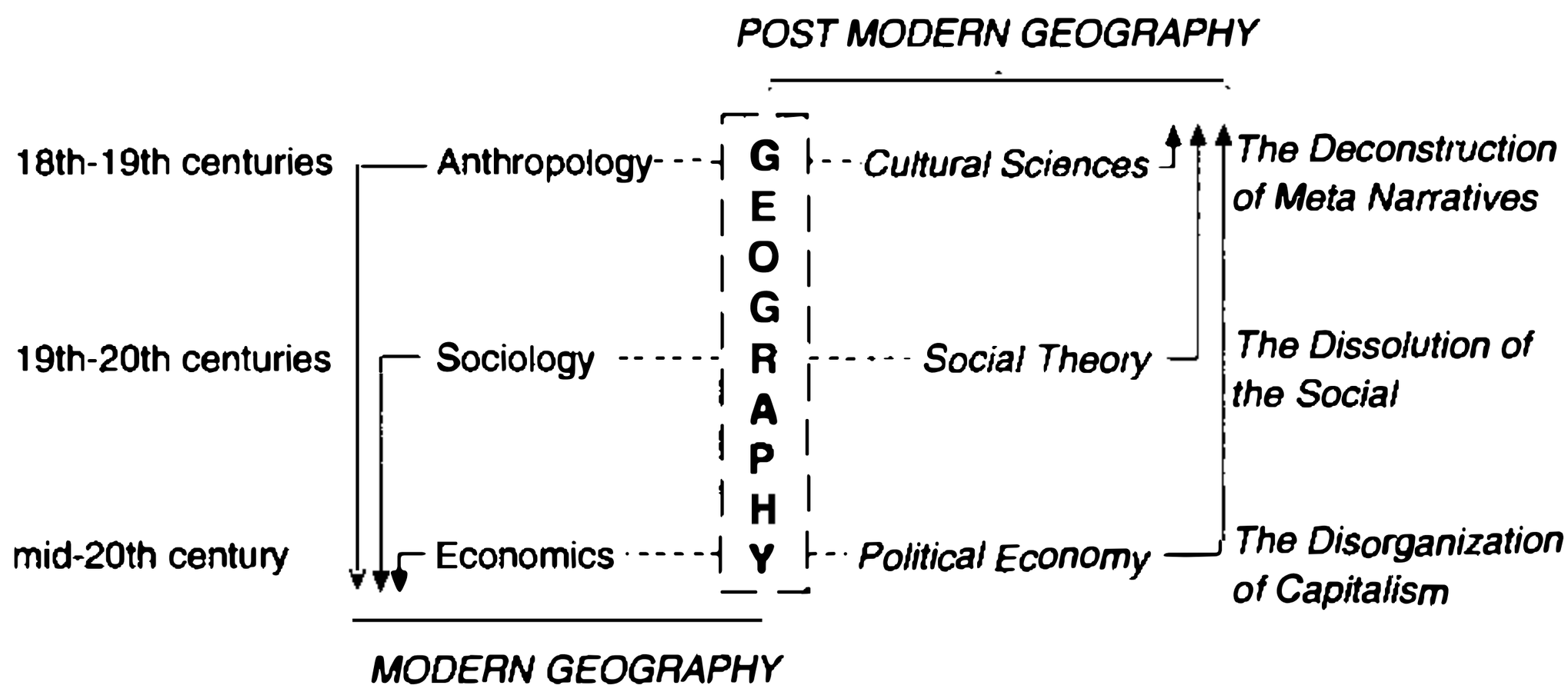

Fig. 14.2 The making and unmaking of modern human geography (*Source:* Gregory, 1989, p. 350).

THE CHANGEOVER TO POST-MODERN GEOGRAPHY

Post-modernism is a recent movement in philosophy, the arts and social sciences. Its distinguishing characteristics (according to Ley, 1994) are: Scepticism towards the grand claims and grand theory of the modern era, and their claim to intellectual superiority. Post-modernism (as contrasted to modernism) stresses openness to a range of opinions in social enquiry, artistic experimentation and political empowerment. Dear (1986) classified modernism into three components: style, method, and epoch. *Style* is intimately implicated in the constitution of meaning and identity of the phenomenon being represented. Styles may, according to Hebdige (1979), either be supportive of dominant ideologies, or they may offer a ritual resistance to movements which are socially and politically opposed to the dominant view. Ley and Mills (1992) note that the same is true about the socially constructed environment whose variations over the earth surface are of special concern to human geography. The post-modern *methodology* is based essentially on the strategy of deconstruction. Deconstruction is defined as a mode of critical interpretation which seeks to demonstrate how the multiple positioning of an observer (an author or a reader) in terms of culture, class and gender etc. has influenced his observation (his writing or reading) of the *text* (the thing being observed or read or written about). Thus, "Deconstruction is essentially a destabilizing method, throwing into doubt the authoritative claims of preceding traditions, and seeking to prise loose alternative readings of texts" (Ley, 1994). Also, post-modernism may be viewed as an *epoch*, that is, a historic era in which changes in culture and philosophy are sought to be located in the very process of the

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evolution of economy and politics at the global level. Thus some commentators regard post-modernism as the culture of late capitalism (Jameson, 1984), an integral part of the new phase of post-Fordist flexible accumulation (Harvey, 1989). This, also, according to Soja (1989), is part of the attack on the predominance of *historicism* in modern system of thought, which highlighted the importance of individual and collective biography of diverse communities in the explanation of social relations but neglected the role of spatiality, so that the role of geographical imagination was marginalized. This subordination of space to time obscured the role of geographical inter-pretation in the changeability of the social world. As a consequence, geography failed to attain its rightful position in the development of theory in the social sciences (*see:* pp. 176–179). Historical materialistic interpretation assumed that society everywhere (irrespective of its spatial context) was characterized by similar historical pulsations in social change. Thus the social theories of historical materialism were deficient and partial in that they ignored the basic fact that the spatial context of history and culture makes a basic difference in how societies interpret particular episodes in history, and develop ways and means of adjusting to them. Consequently, the historical flow of social change was not the same everywhere. Post-modernism represented a response to modernism as a homogenizing force and to its totalizing theoreticism. Instead, post-modernism lays stress on discontinuities and disjunctures characteristic of everyday life in the real world. The homogeneity in the built-up landscape of the era of "organized capitalism"—or the Fordist era, as it is sometimes called—is contrasted with the heterogeneity of economic, social and political life in the current phase of "disorganized capitalism" (or of flexible accumulation of the post-Fordist era) (Harvey and Scott, 1989).

The post-modernist emphasis on heterogeneity, particularity and uniqueness of phenomena in differing contexts of time and space, would appear to hark back to the regionalist tradition in geography of the Vidalian era: Post-modern thought provides a theoretical context for the study of spatial/areal diversity in the life-world. Viewed thus, post-modernism in geography is closely linked to the rise of a "new" regional geography referred to previously (pp. 256–259). The difference between the old style regional differentiation in geography of the Hettner-Hartshorne era, and the present-day post-modernist regional geography lies in that, while the former was indifferent to everyday experience of societal relationships, there is now a declared commitment to the understanding of the condition of man in particular places, and the ways that spaces are socially constructed. Post-modernism is also a pronouncedly anti-spatial science in terms of the spatial scientist's search for pattern laws of behaviour. Post-modernism does not aspire to generate any grand theory of universal application; its essentially heterogeneous ethos runs counter to the emphasis on consensus on theoretical perspectives (that characterized the discourse in the spatial science era). Instead of universal theory, the emphasis now is on what Dear (1988) called, the contemporaneity of social process over time and space, so

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that geography, like history, is preeminently a contextual discipline, engaged in the time-space reconstruction of social life.

The movement toward post-modernism in geography (i.e., unmaking of modern human geography, Fig. 14.2) started in the 1970s with the introduction of the political economy perspective in human geography—a perspective that reoriented human geography to the condition of man in society and gave rise to the "radical" or "relevance" revolution. In the words of Gregory, the cutting edge of the political economy perspective was the *logic of capital* scrawling its signs on the surface of the landscape—as against the *logic of space* (i.e., geometry) that dominated spatial science geography until the 1960s. Thus, the focus of post-modern geography became a focus on uneven development in the spatial context. There was an inevitable confusion in conceptual design in the beginning owing to the fact that political economy derived its perspective from predominantly Marxist thought, and Marx's writing, howsoever liberally interpreted, contained little about space. The rise of the political economy perspective in geography almost coincided with the emergence of what Harvey (1987) called "disorganized capitalism". Commentators now began drawing attention to the fact that the Marxist view of capitalism was deficient in that production of space is focal to the development of capitalism in the twentieth century, and the new regime of "flexible accumulation" depends upon the production of "a tense and turbulent landscape" with disjointed space economies. Such developments in space economy are fragments of a still larger mosaic:

> ...of Castell's "new relationship" between space and society, formed by the hypermobility of capital and information cascading through a vast world system, where "space is dissolved into flows", "cities become shadows" and places are emptied of their local meanings; of Jameson's "post-modern hyperspace", part of the cultural logic of late capitalism, whose putative "abolition of distance" renders us all but incapable of comprehending—of *mapping*—the decentred communication networks whose global webs enmesh our daily lives (Castells, 1983, p. 314; Jameson, 1984) (Gregory, 1989, p. 353).

Towards the end of the 1970s, working out the implications of historical materialism thus moved beyond Marx's original thesis to fashion a post-Marxist theory of socio-spatial structuration which emphasizes that *people not only make history but also geography*—which is to say that time-space relations are intrinsic to the constitution of societies (Gregory, 1978). Such a view cuts into the sociological concept of *societies* as totalities with clear-cut boundaries, and renders them extremely unstable, since under the new concept, society becomes the product of the varying spans of time and space.

This ends the earlier view of dualism between society and space, between agency and structure. Such a (supposedly) Kantian view of division between the social and the spatial was made all the more distinct in the spatial science episode in human geography. This duality (born essentially out of the urge to apply the methodology of the natural sciences to the

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study of sociological phenomena) had long been attacked by scholars of hermeneutics (the study and interpretation of meaning) from the time of F. Schleiermarcher (1768–1834) and Wilhelm Dilthey (1833–1911). Dilthey had argued that the human sciences, owing to the peculiarity of their subject matter, required a special methodology very different from the empirical methodology of the natural sciences. This special methodology was hermeneutics that tried to search for meaning in all kinds of activities and objects, including tools and landscapes as well as individual biographies. Hermeneutics went beyond mere physical appearances—physical and physiological processes, and surface patterns—to seek deeper meanings and causes by paying attention to the meaning and motivation behind actions. But hermeneutics was not a barrier to objective knowledge. Hermeneutics was introduced in human geography in the mid-1970s through the writings of Buttimer (1974) and Tuan (1974), and was in late 1970s visible under two different titles: humanistic geography, and critical theory. The latter was proposed by Gregory (1978) with a view to linking the hermeneutical approach to a critique of traditional historical and regional geography. Thus by around 1980, the supposed dualism between space and society was finally broken, since with such a linguistic/hermeneutic turn, the problem of geographical description became much more than a mere matter of abstract logic: It became "a question of reading and decoding", of "*making sense* of different places and different people". Thus, as in the case of ethnography (Geertz, 1983), in geography also, the stress was now once again on local knowledge, which "requires us to attend not only to the theoretical categories which inform our accounts but also to the textual strategies through which they are conveyed".

The linguistic turn to the study of human geography through the introduction of hermeneutics now made geography open to experimentation with different modes of representation, so that the discipline reopened its doors to cultural studies through greater interaction across the frontier with other branches of cultural studies. Thus was completed the post-modernist journey in human geography, beginning in the 1970s, through political economy of the disorganization of capital (and thereby highlighting the relationship between history and geography, structure and agency), followed by the dissolution of the barrier between the social and the spatial, arrived at through revival of the frontier between geography and sociology by giving greater attention to social theory. This was followed by opening of the frontier with other disciplines focused on the study of cultures. The *post-modern* journey thus followed a route in an order that represented the reversal of the route charted by *modern* geography (Fig. 14.2), but the reverse journey was imposed by the turn of developments in the contemporary capitalistic system—a consequence of history. It represents essentially a process of evolution so that post-modernism must not be seen as a negation of everything that earlier human geography represented, but as "a commentary upon it" (Gregory, 1989). The crisis of "modern" geography until the mid-1970s lay in that geography had cut itself loose from

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mainstream philosophy, humanities and the social sciences so that the post-modernist response lay in a realignment with these other streams of knowledge for intellectual leads, particularly with social theory, but asserting at the same time that there is no scope for grand theory in human geography. Indeed, post-modernism focuses on the creative tension between the different theoretical formulations, so that post-modernism is essentially polyphonic: It combines a number of individual but harmonious melodies, i.e., points of view or perspectives, with a view to arriving at more comprehensive explanation of social reality.

Gregory (1989) has identified three distinguishing features of post-modernist thought in geography: First, space-time specificity in social explanation. This implies that post-modernist thought in social science insists on the understanding of "a world which is meaningful for the people who live within it". Reflexiveness (implying focus on the role of the human agent's action upon himself or the identity between object and subject) is intrinsic to post-modernist work in the social sciences but this does not imply complete repudiation of the scientific principles of naturalism though the search for universal theories is eschewed (*see:* Gregory, 1991). Secondly, post-modernism insists on distancing itself from the totalization (i.e., the concept of the society as a totality following a universal process of historical change irrespective of space context). Post-modernist thought holds that: "The ebb and flow of human history is not reduced to the marionette movements of a single structural principle, whatever its location, and the differences which make up human geographies are not explained by some central generating mechanism". Thirdly, post-modern human geography represents a *critique* of spatial science—it is *not a continuation* of it—but at the same time, *it does not represent a break with the past*. Post-modern geography focuses on the essential *spatiality* of social life (rather than the geometry of social behaviour).

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15

Progress Since World War II: Continuity, Change, Rapprochement, and Convergence

Progress in geography—as in any other branch of social science—is far from an autonomous, disembodied process with its own internal and inexorable logic. Disciplinary progress represents a history in which we are implicated both as members of a profession and also as aware citizens. It is necessary, therefore, that we focus on the social-intellectual context of progress since only through such an approach can we arrive at an understanding of how changes in societal perspectives over time had led to the new kinds of theoretical methodological debates leading to changes in disciplinary perspectives on what was worth investigating and how. As social scientists, geographers are concerned to discover not only the world in which we are living, but also to discover how, as geographers, we inhabit, reproduce and change that world (Kobayashi and Mackenzie, 1989, p. 1). In this concluding chapter we present an overview of the changing contexts of progress in geography since World War II, more particularly over the past quarter century dating back to the beginning of the relevance debate. But first, a brief commentary on the earlier period is in order.

Underlining the fact that its status as a fundamental science notwithstanding, geography has not been on the forward salients in science, nor have we been closely associated with those who have, Ackerman (1963) wrote that the reason for this was that in the teens and early twenties of this century, our closest associations were with history and geology. This association did not help to correct the predisposition of geography to the deceptive simplicity of geographic determinism; and later when determinism had started to fade, geography had opened up frontiers with the social science disciplines so that determinism was replaced by possibilism as the guiding perspective in the study of man's relationship with the environment. However, the underdeveloped state of the social sciences during that period had offered few sources of inspiration and fresh insight. Only in the 1950s did this association begin to yield fruitful results in the form of new methods of study derived from mathematical statistics that were first applied in biometrics, anthropometry and econometrics.

This was the beginning of the so-called quantitative "revolution" in

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geography leading to, what Burton (1963) had termed as, "radical transformation of spirit and purpose" of geography through increased mathematization of argument and the attendant emphasis on the construction and testing of theoretical models, so that from then on, geography became an open-ended field of inquiry. This was in sharp contrast to the position obtaining in the prequantitative phase, when our preoccupation with the search for professional identity had led to intellectual independence and isolation from other fields of knowledge. Our only cross-disciplinary associations were with cultural anthropology and geomorphology, both of which suffered from similar problems of isolation.

The dominant view of geography as areal differentiation had "favoured a goal of investigation independent of the goal of other sciences"; the same was also true of the concept of areal organization (Platt, 1959). The real tragedy of geography as a discipline lay in that we neglected the axiom that "The course of science as a whole determines the progress of its parts, in their greater or lesser degrees" (Ackerman, *op. cit.*). The great significance of the quantitative revolution lay in that through its renewed focus on space and spatial interaction (in place of the earlier exclusive focus on place and areal differentiation, and areal organization), it had greatly broadened the scope of geographical research by enshrining geography as a spatial science so that now all kinds of spatial flows economic, social, political and any other, became incorporated as its legitimate disciplinary concerns. No more questions about what was in or out of the purview of geography: Everything with a spatial component formed part of geographical investigation. The logical positivist turn to geography had introduced new standards of rigour in research through increased emphasis on analysis, generalization and theory. This period of rejuvenation of geography as spatial science was greatly aided by the fortunate arrival of the concept of the General System Theory (*see* Boulding, 1956) and the invention of the electronic computer which brought about great efficiency in multivariate analysis. Thus the 1960s appeared to celebrate a new dawn for geography as a living discipline.

The euphoria was relatively short-lived, however, since by the middle of the 1960s it began to be felt that the new quantitative turn to geography as a science of spatial analysis with its central focus on identification of pattern laws of behaviour in space had contributed to shift attention away from the real to the abstract spaces, and from the everyday processes that generate behaviour to the surface impressions of behaviour. To meet this objection, many called attention to the need for the study of behaviour in the context of man's perception of reality in space and time. This gave to geography a psychological turn leading to the introduction of new variables such as cognition and mental structuring of the decision-makers as important determinants in understanding man-environment interaction and the resultant patterns of behaviour, but most actual research in behavioural geography was firmly located in the spatial science tradition of the search for pattern laws of behaviour in space. Irrespective of a psychological turn,

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the human agency was yet to move to centre-stage in human geography research. Focused anthropocentrism in geography came only with the humanistic perspective later in that decade. As against the law-seeking nature of behavioural geography, humanistic geography was idiographic in ethos, so that it was focused on the study of individuals and small groups, and on the evolution of cultural landscapes in particular places as the outcomes of intimate interaction between nature and culture. Humanistic geography was focused on understanding, meaning and value, and was indifferent to considerations of utility and theory. The latter considerations became the watchwords in the new perspective in human geography generally identified as the radical political economy (or historical materialist) perspective. Both humanism and historical materialism were critical of the spatial science tradition of value freedom, and the "thingification" of human relations. Although both humanist and the political economy/historical materialist perspectives focused on the role of the human agency in geographical research, the two systems of thought were at that time generally viewed as alternative (and mutually opposed) views of social reality. This was a source of much confusion and confrontation in research practice until the mid-1980s when attention began to be drawn to elements of complementarity between them.

The social and economic context of the late 1960s and early 1970s in which man-centred focus in human geography was revived, was marked by a wide range of protests and problems across the industrialized world in America and Europe. There were protests and problems that shattered the already weakening idea of social equilibrium—a process that was concretized into a variety of movements championing the cause of equity and social justice, and calling to bring about social change in favour of the underpriviledged. Naturally enough, the prevailing social convulsion had led to a period of critical self-examination within the environmental disciplines such as geography and planning, and in regional and urban studies in general. This led to a renewed concern for social relevance in geographical research, a concern that was focused on improvement of the human condition. Such a focus inevitably called for a broad and all-encompassing vision in the analysis and resolution of the urgent problems of society and environment. Such a vision led to the crumbling of the existing boundaries of conceptual categories, so that there was a definite trend in favour of interdisciplinary discourse.

The societal convulsions of the 1960s and early 1970s were part of an ongoing process of social reconstruction generated by changes in social and economic life, and by increased globalization of communication. These changes were the source of a major paradox: Improvements in technology were leading to more efficient exploitation of resources and production of goods, but this also meant reduction in jobs and increase in unemployment levels. Simultaneously, globalization was leading to increased homogenization of economic and cultural structures. All this forced retrospection on the existing perspectives in the study of relations between

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peoples and their environments. In such a scenario it was natural that while one section of geographers should seek to understand the constitution of meaning and values involved in man-environment interaction, others should focus on the importance of structural links which created and conditioned the forms of environmental appropriation. The former constituted the humanistic perspective and the latter the historical materialistic perspective in human geography. This required both a new concept of social totality and of social change:

> Although change had been embedded in the earlier regional tradition, it was an evolutionary concept of change, change which appeared to move in slow, albeit graceful, sweep across a people and a (usually rural) landscape, change which left distinct traces. We appeared to be living in a *revolutionary* period, where change was rapid. Buildings fell, countries divided, spaces for previously inarticulate and formless groups (women, gays, blacks, international refugees, and victims of family violence and psychiatric treatment) were created overnight. The rhythm which had governed the regionalists' evolutionary change had given place to an often discordant but exhilarating beat. Change was also present in spatial science but it was a flat and personless change. One could assume there were real people creating those patterns, flows and hierarchies, or at least the phone calls or shipping the goods which generated movement, but it was difficult to put faces on them. They acted but apparently without feeling, emotion, or the consideration of alternatives (Kobayashi and Mackenzie, 1989, pp. 4-5).

The revived focus on social relevance in the 1970s had brought to an end the period of unexamined theoretical and institutional optimism. The new generation of geographers busied themselves in ensuring their profession a place in the new society which was emerging out of the shifting protests and alliances being formed all around them. It was under such a scenario that the new paradigms of humanism and historical materialism had entered geographical work. The former focused on the importance of the human agency in man's environmental relations, while the latter argued that society constitutes a structural unity so that historical materialists were explicitly concerned to understand and change existing structural relations defining the nature of social production and reproduction.

Both the perspectives represented a concept of social totality which allowed scope for social synthesis and the study of social change, although to begin with, the two perspectives were treated as alternatives and radically different from each other. Humanism was focused on people who were supposed to be endowed with infinite creativity so that they built out from themselves structures of meaning, value and significance in landscapes and places that represented structures created and modified by human experience. As against this, historical materialism believed in a connected social totality exposing layers of relations, and the complexity of constraints and conditions in which man's life was embedded and through which individuals were created as social beings and as members of particular social groups or classes. Historical materialists were critical of lack of

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structural rigour in humanistic geography and its *asocial* and *transcendental* response to the question: "What constitutes social totality?" On their part, the humanists were critical of historical materialism's apparent determinism of human agency by social structure, and its mechanistic and reductionistic definition of the individual by external forces. However, the earlier impasse between humanism and historical materialism has now been overcome in face of the changed social reality which is raising new questions that call for more wholesome methodological responses.

> Although the 1960s and the 1970s may have been bewildering periods to live through, in retrospect they are becoming more coherent, as are our own responses. For, this was a period when social equilibrium was the conventional wisdom, and where, as a consequence, the conventional "solution" was social engineering. The answers had been found. Science was carefully naturalizing, and where necessary rectifying, minor problems in the adjustment of different groups, classes, genders, races. It was a period where the shattering of the conventional wisdom was thrust upon us by open and evident protest which articulated, if not elegantly, very forcibly and occasionally violently, the existence, even the dominance, of disequilibrium. It was a type of education in which confrontation was accepted as the appropriate, perhaps the only, form of teaching (Kobayashi and Mackenzie, 1989, pp. 7-8).

The changed contexts since the 1980s have moved us from the earlier position of mutual misunderstanding toward one of rapprochement that has given rise to a new phase of mutual respect for each other. This rapprochement has set the stage for "Remaking Human Geography", as the Kobayashi-Mackenzie volume of essays is aptly named (Also *see* Cloke, Philo, and Sadler, 1991). In this process of rapprochement, the historical materialists have moved towards, a concept of history that is focused on human agency so that "It is now widely believed that the study of human geography raises theoretical questions as to the nature of, and relationship between, the individual and society"—"the human agency and social structure" (Harris, 1989, p. 79).

The difficulty with historical materialism lay in that it focused the social agenda on political relations, and in that preoccupation it reduced the human agent to structurally determined actors devoid of independent initiative for social change. In the current phase of convergence, we are moving forward towards a relational concept of social totality populated by motivated human agents. The humanist perspectives also have undergone a complementary transformation. In earlier work under this perspective in geography (particularly that influenced by phenomenology), knowledge was viewed as reflexion of the world rather than as engagement of reality, with the result that humanist work had become cut off from the general concerns of social science in developing understanding of social-political relations and making attempts to resolve problems of equity and social justice. Now, since the 1980s, the humanist concern for man-centredness of social life, for reflexivity, and inseparability of fact and value, "have been

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carried forward in a growing trend toward empirical work that is both philosophically informed and firmly rooted in material existence" (Kobayashi and Mackenzie, *op. cit.*, p. 9).

Pointing to the need for rapprochement for, and convergence of, the humanist and the historical materialist perspectives, Cosgrove (1989, p. 205) maintained that, "The tension between the two ways, one of knowing and one of explaining, can be a creative one, in research to be sure, but above all in teaching our geography as a celebration of the diversity and richness of the natural world and of the places that human societies created in their attempts to make over that world into the homes of humankind." Another scholar points to "the fusion of praxis to create congruence of structure and the agency of individuals [in landscape study]", since, "Historical processes... may provide the basis for structuring of landscape as a way of life" (Ley, 1980). In each case the landscape is "depassement of ideology, a statement of the social relations of its production and the ground for further development of geographical landscape studies" (Kobayashi, 1989, pp. 180-181).

The three dominant paradigms in postwar human geography have been: Logical positivism, humanism and historical materialism (or radical political economy). As Ley has summarized it:

> logical positivism arrived in geography in the 1960s, and offered valuable standards of rigour and objective procedure of verifiability through hypothesis testing. But positivism has always been more vulnerable in explanation beyond observable phenomena: Humanists identified its weakness in dealing with intangibles, the subjective and intersubjective worlds, and in particular its incapacity to deal with questions of meaning. Structuralists in turn criticized its empiricism, its confinement to observation language which rendered it unable to account for hidden and underlying causes (Ley, 1989, p. 233).

Ley draws attention to three different attempts at synthesizing these perspectives. The earliest was Berger and Luckmann's *The Social Construction of Reality* (1966). The second was the attempt by the Frankfurt school, especially by Habermas (*see* Berstein, 1985) "whose argument is both largely abstract and, also, has not achieved a formal integration of the three realms of discourse". The third, and currently most popular in human geography, is the "structuration" approach of Anthony Giddens (1984). But according to Ley, Giddens' outline is perhaps, less a thesis than a framework, an inventory of important issues, but issues which are aggregated rather than synthesized, so that, "In unsophisticated hands, it can become little more than a checklist, proffering an advice that all things are dialectically related, but without specifying lines of determination" (Ley, 1989, p. 234).

Addressing the question of the relationship between humanism and historical materialism, Andrew Sayer has underlined that concrete research invariably has to mobilize and integrate concepts from several theories, in order to capture the many-sided nature of the subject under investigation. In this regard,

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> Synthesis goes one step further, covering a host of such phenomena, though, of course, even then one's interests are selective. While analysis requires abstraction, synthesis in the sense of "thick description" requires the development of an ability to command a wide variety of abstractions, theoretical constructs and schemata.... Just as a musician's ability is enhanced by a facility in a large range of different rhythms, scales, chords, etc., and a deep understanding of their structures and interrelationships, so the "art" of synthesis requires a command over a range of overlapping theories and methods (Sayer, 1989, p. 223).

The emerging scenario in human geography through rapprochement between the two rival paradigms of human geography research since the early 1970s presents (in Ley's view): "Tantalizing possibilities for a renewed human geography, one which is more representational (or empirical) than the recent past, more contextual in its regional, cultural and historical specificity, which seeks to integrate facts and meanings, both the objective and the subjective". Ley also sees implications "for synthesis as opposed to analysis, for the place of theory which now lies much closer to the ground in conceptual heuristics and lower order generalizations, and for the style of discourse that reaches beyond the private lexicons of speech communities" (Ley, 1989, p. 244).

The current theoretical debate in human geography regarding the discipline's content and nature is, in many ways, fundamentally different from the nature of the dialogue in the 1970s. According to Gregory (1989, pp. v–vii), the salient features of the current dialogue are: In the first place, earlier there was a tacit assumption that solutions to most of the problems that geographers deal with had to be found in the methodology of some other priviledged field of study and then incorporated in our own methodology, so that geography depended on the developments in other disciplines. This situation has now changed, in that now there is an increasing recognition of the importance of intrinsically geographical concepts of place, space and landscape across the whole field of humanities and social sciences. Thus within human geography

> humanism can no longer be portrayed as a parochialism in which the day-to-day lives of particular people in particular places is the tangible focus of study, any more than historical materialism can continue to be criticized as a brute globalism in which the specificities of history and geography are read off from the universal logic of the (capitalist) mode of production.

Secondly, human geography today is "increasingly concerned with making sense of the dynamics of concrete 'language-games', and not...with 'discovering the Continent of Meaning and Mapping of its bodiless landscape'". There is now a focused attempt to recast the relations between Grand Theory and "local knowledge". Thirdly, the walls of old absolutisms have fallen so that there is greater recognition about the plurality of traditions both within humanisms and historical materialism, and this is accompanied by emphasis on recognizing increasing cross currents between the two.

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The result is that "both humanistic geography and historico-geographical materialism have become more participatory projects" (Gregory, 1989).

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